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TALENTS AND TEMPERAMENTS

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THE PSYCHOLOGY OF VOCATIONAL GUIDANCE

by

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To

MY PARENTS

GENERAL INTRODUCTION

The Contemporary Library of Psychology has been planned to meet what is felt to be a need alike of the student and of the large and growing public who take a keen and intelligent interest in the subject. In common with all other sciences, Psychology is continually enlarging its boundaries by the discovery of fresh facts, the construction of hypotheses to explain them, and the verification of the hypotheses in experimental conditions. Unlike those of the other sciences, however, the claim of which to acceptance has long been established, its principal achievements are of comparatively recent origin. No doubt many of its problems are as old as philosophy itself; but their ancient solutions were of a highly speculative character, and it is only since the application of scientific method to the data of mental life that it has been possible for Psychology to take its place within the ranks of the empirical and experimental sciences.

Its scientific progress, however, has since then been astonishingly rapid; so rapid, indeed, that it has not failed to be accompanied by certain dangers incidental to speedy growth from infancy to adolescence. There have been the dangers, not always successfully avoided, of non-observation and of mal-observation, of hasty generalisation from

minimum. The Series will, it is hoped, embrace all the major topics of the science, including those of Comparative, Abnormal and Applied Psychology. In this way each volume will be complete in itself; while the Library as a whole will cover the entire field of Psychology.

With this aim in view, it is confidently hoped that it will prove to be of real service both to the student and to the general reader.

F. A.

PREFACE

The art of vocational guidance cannot easily be learned from books—certainly not from a book of the dimensions of the present volume. I claim to have written no more than a short introduction to the subject. My primary aim has been to serve the growing body of inquirers—teachers, social workers and parents—who wish to be told briefly and simply what methods are being used, and what results have been achieved, in this new field of applied psychology. For the criticisms of such persons I should be especially grateful.

Should any merit be discoverable in these pages, it is because I have enjoyed almost unique opportunities of studying the problems of vocational guidance in a very practical way during seven years spent in the service of the National Institute of Industrial Psychology. I wish to record my sense of extreme indebtedness to the Chairman and Executive Committee of the Institute, who, of course, are not to be held responsible for any opinions which I have expressed on controversial matters.

I am very grateful also to those who have helped me, either by permitting reference to individual cases or by supplying information concerning developments in foreign countries. Finally, I am deeply indebted to the General Editor of this Library, to Dr C. S. Myers, F.R.S., and to my wife, for most helpful criticisms and suggestions; and to Mr Alec Rodger, M.A., for carrying out with extraordinary thoroughness the task of compiling the index.

A. M.

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CHAPTER I

THE PROBLEM

¶ 1. OCCUPATIONAL MISFITS. That the work in which a man spends one half of his waking hours should, if possible, be such as he can perform successfully and happily is a proposition which receives the very ready assent of persons of sane mind. Yet the gravity of the problem of the occupational misfit is not very widely recognised, perhaps because inefficiency at work is so common a spectacle that it is taken for granted as one of the necessary evils of an imperfect world. The more tragic instances of occupational failure which come to the notice of any one individual are relatively few; and the immensity of the total human suffering and economic loss resulting from unsuitability of employment is overlooked.

Vocational maladjustments vary in kind and in degree. Some of the minor forms are comparatively innocuous, and one might even argue that the world would be the poorer without them. If all plumbers suddenly became perfect plumbers, considerable dissatisfaction would no doubt be caused to the perfect plumber and considerable inconvenience to the professional humorist. But, unfortunately, there are multitudes of men and women whose lack

of adaptation to their work is no matter for mirth. The man of intelligence and initiative, doomed to spend his days in routine tasks; the man of limited capacity, painfully conscious of his inferiority, struggling vainly to accomplish what is beyond his powers; the man of independence and reserve, forced to feign servility and to assume an unnatural affability towards those whom he despises; the timid, unassertive man, daily at the mercy of those whom he should command; the excessively scrupulous man, whose duties constantly involve him in agonies of moral conflict; these are but a few familiar examples of incompatibility between the characteristics of the worker and the requirements of the work. What pictures of misery are suggested by their bare narration!

¶ 2. CONSEQUENCES OF MALADJUSTMENT: TO THE INDIVIDUAL. Such men are like machines that have ceased to function as their makers intended; there is a straining and a jarring in their mental 'works', and ultimately, in many instances, there is a complete break-down. For, like any other form of acute mental stress, the profound dissatisfaction occasioned by uncongenial work may conduce to health disorders of a very grave kind. Actual insanity may result, as in the case, quoted by McDougall,[1] of a young man who, placed in a position of too great responsibility, became more and more anxious and depressed until he finally retired from work, and indulged in behaviour so

[1] *Cf.* W. McDougall; *An Outline of Abnormal Psychology;* London, 1926.

irrational and violent that it was found necessary to commit him to a mental hospital.

An unwise choice of work may be dangerous, not only to mental health, but also to moral character; for, as Burt has shown, there is a very definite relationship between uncongenial employment and juvenile delinquency. Failure at work may mean loss of self-respect; and self-respect is the great custodian of virtue. Sometimes a special mental aptitude for which a young person's occupation affords no exercise tends to find expression in undesirable ways. The boy with an unused mechanical ingenuity takes to picking locks or tampering with slot machines; and the individual who possesses a special gift of language which he has failed to utilise in a legitimate field "easily swerves into a dishonest path, and exploits his verbal facility for the concoction of specious and persuasive tales—begging, swindling, perpetrating frauds, and engaging in groundless and aggressive litigation".[1]

Again, the maladjusted worker must often fail to achieve material prosperity; and such failure, in addition to aggravating his mental discontent, may affect his physical well-being and that of his dependents, who, indeed, may suffer in more ways than one. The man who is continually harassed or irritated by the day's toil in the factory or the office is not likely to gain complete serenity of mind on the way home. He may acquire a permanent attitude of bitterness which will poison all his domestic and social relation-

[1] *Cf.* C. Burt; *The Yonng Delinquent;* London, 1925.

ships, making him as great a burden to others as he is to himself.

¶ 3. CONSEQUENCES OF MALADJUSTMENT: TO INDUSTRY AND SOCIETY. The employer, if through ignorance or leniency he retains the services of the incompetent muddler, suffers on account of the inferiority, in quantity or quality, of the work done. If, on the other hand, he discharges him, he is involved in the expense of training a substitute who may prove to be no better than his predecessor. Occupational maladjustment is a prime cause of labour turnover, the annual loss occasioned by which is incalculably great.[1] Moreover, the loss from industrial absenteeism, sickness and accidents is fundamentally due in no small measure to the same cause. Finally, the misfit is commonly a grumbler and an agitator; and the effects of his discontent on the *esprit de corps* of his fellow workers may be very unfortunate and far-reaching. Of all the sources of friction and wastage in industry and commerce the employment of men and women in unsuitable tasks must unquestionably be given a place of very high importance.

But the damage is not confined to the world of business, for all classes of the population are affected by the grit in the business machine. The public generally pay unnecessarily high prices for inefficiently, and therefore expensively produced articles. They pay for the maintenance and care of the criminals and unemployables whose

[1] *Cf.* P. S. Florence; *Economics of Fatigue and Unrest;* London, 1924.

deplorable state might have been prevented by wise occupational guidance. And they suffer immmerable petty losses and annoyances through the relative incompetence of multitudes of workers employed in trade and in the various public services. And what of the professional misfit; the stupid physician, for example, and the incompetent and nagging teacher? One has only to imagine the havoc that can be wrought by these twain to realise something of the price that society pays for its failure to solve the problem of the square peg in the round hole.

¶ 4. OCCUPATIONAL CHOICES: THE ELEMENTARY SCHOOL PUPIL. Now this most critical of choices, the choice of an occupation, is one which annually confronts many thousands of children of the tender age of 14, many of whom are comparable in mental development with the normal child of 11 or 12. It is an age not only of intellectual immaturity, but also of emotional instability. It is an age at which no thinking person would entrust a child with the responsibility for a decision on any other important and difficult issue, even if all the information relevant to the problem could be placed at the child's disposal. And it is an age at which the child's information relevant to his vocational problem is usually somewhat meagre and inexact. Nevertheless, it is an age at which very many children confidently choose their own careers. Is it to be wondered at that the reasons which they give for their occupational preferences are often as ludicrously inadequate as are those of the amateur punter who backs the horse which owns the

most attractive name or carries the most gaily decorated jockey?

It is true that the child leaving the elementary school has some knowledge of himself and some acquaintance with a limited number of occupations in the world around him. He knows, for example, whether he is particularly skilled in arithmetical computation, or particularly incompetent in handling mechanical appliances; and he knows, in a vague general way, what are the duties of the carpenter, the engine-driver, the postman, and the grocer's assistant. And often, in the light of his limited knowledge, he puzzles out the problem logically enough. If he is an epileptic, he will not usually wish to become a steeple-jack or a window-cleaner. If he realises that he does not possess "an eye, like Mars, to threaten and command", he may decide that he was not born to be a sergeant-major or a rent-collector. And if he has found himself both interested and successful in activities demanding delicate manual adjustments, he may suppose, reasonably enough, that the trade of the watch-maker or the jewel-mounter would afford him considerable satisfaction. But the requirements of almost any occupation are numerous and varied; and usually the child's knowledge, both of himself and of the work, is much too limited to enable him to view the problem in its entirety. He may, indeed, be fortunate enough to discover that work which he judged suitable for one particular reason happens to be suitable generally; and, thanks to the adaptability of human nature, he may find it possible to settle down with a moderate degree of contentment in a job which proves

very different from that which he imagined it to be. But often his judgement is so erroneous that neither adaptability nor luck can save him from unhappiness and failure. And often it appears that he has attempted no judgement at all, but has drifted into an occupation as a result of more or less irrelevant considerations, such as the desirability of working beside one of his school companions, or the mere proximity of a large factory to the street in which his home is placed. It is common to find, in a single school, children of the most varied characteristics all anxious to enter a particular trade merely because it is reputed locally to be a "good" trade in that it offers stability of employment and comparatively generous remuneration. And it is not uncommon to find one and the same child attracted to two occupations so different in their nature and conditions that a person fitted for the one could scarcely be imagined tolerating the other.

¶ 5. OCCUPATIONAL CHOICES: THE SECONDARY SCHOOL PUPIL. The vocational choices of the pupils of the secondary school might perhaps be expected to be more rational and less haphazard than those of the children entering the humbler occupations; yet even among such pupils the grounds of the decision are commonly of the most unsubstantial kind. In a study of a large group of secondary school pupils Valentine and Ritchie[1] found 50 per cent. of the senior boys and 80 per cent. of the senior girls "choosing

[1] *Cf.* C. W. Valentine and F. M. Ritchie; "An Enquiry as to the Reasons for the Choice of Occupations among Secondary School Pupils"; *The Forum of Education;* Vol. V, 1927, and Vol. VIII, 1930.

their occupations for wrong or inadequate reasons, or at least having themselves a very inadequate idea of the reason why a given occupation was chosen for them". It was found, too, that trivial motives were actually more common among the older girls than among the younger. "My parents agreed that as I had had headaches occasionally I needed a profession where holidays were frequent", wrote one girl who had chosen the career of the teacher. "To be a teacher", runs the quaint reasoning of another, "you must be clever. I should like to be clever, so I shall be a teacher". And here is the cautious statement of a rather indolent youth who had selected the same profession:—"The teacher gives his class something to do and all that he does is to see that it works properly. Of course I may be wrong, and perhaps teachers really do a lot of work, but as far as I can see this profession is the only one that would suit me".

Comparative success in a particular subject in the secondary school is often the basis of a mistaken choice. Girls commonly desire to become "foreign correspondents" although they have no knowledge of that work beyond a vague notion that it provides an opportunity for the display of linguistic ability. And what disillusionment must await many of the boys who aim at architecture merely because they have shown a certain skill in draughtsmanship, and many of those others whose facility in English composition prompts them to seek their fortunes in Fleet Street! Sometimes it is *failure* in a school subject that constitutes a main determinant of the vocational choice, as in the case of a girl who wished to take up nursing because she had no head for

figures; it had occurred to her that arithmetic did not enter very largely into the life of the hospital ward and that, therefore, this was a life which she could not fail to find congenial. Pupils who are backward in all their school studies not uncommonly choose artistic callings for no other reason than the negative one that here at least is a sphere of work in which general academic attainments are of little account. Others, anxious to escape from scholastic drudgery, demand "outdoor work", although often far from suited for any occupation answering that description.

Seldom does one find that the problem has been considered carefully in all its aspects, or, indeed, that the individual has the knowledge which would enable him to take the all-round view. A career at the Bar is chosen merely because a boy is fond of arguing, because he is ambitious and wishes to make a name for himself, because he is independent and wishes to be his own master, because he has met a number of barristers and found them likeable persons with interests similar to his own, or because he desires work which may necessitate his living in London, and so provide him with a satisfactory excuse for cutting adrift from an unhappy home. The vocational choices of even the most gifted university graduates are often influenced by unimportant considerations, and often based on superficial or one-sided views of the occupations. Indeed, a brilliant university man has furnished what is perhaps the choicest example that has come to the writer's notice of a vocational decision determined by totally irrelevant circumstances.

Case 1.—A student in the faculty of arts of a northern university was greatly attracted by the clever, if frivolous, verses contributed regularly to the university magazine by a distinguished band of medical poets. He was especially attracted by the wonderfully euphonious words, mainly of Greek derivation, which the authors had acquired in the course of their studies and which they used with great effect in their poetical effusions—beautiful words like *systole* and *diastole*. Being himself no mean poet, he experienced a great longing to master the Greek of the medical textbooks, and he seriously maintains that this was the chief factor influencing his decision to become a doctor. He completed the medical course, but he has not practised his profession, this being almost the last work in the world that he would like to attempt.

¶ 6. INTEREST AND APTITUDE. It may be questioned, however, whether the reasons offered by the child in defence of his occupational choice invariably provide the whole truth of the matter. Often these reasons appear to have been formulated after the event, in order to justify to others a vocational interest which is not based on logical considerations at all. Sometimes, indeed, the child explains that he has no reasons to give, except the one reason that the work attracts him strongly and he feels quite sure that he would like it. The occupation has made a direct appeal to some dominant feature of his emotional constitution, so that it is a case not so much of the boy choosing the work as of the work choosing the boy. The writer has

described elsewhere[1] the case of a boy, "heavy and immobile and inarticulate, who, having watched men making tombstones in a yard which he daily passed on his way to school, conceived a great ambition to become a 'monumental mason'. Granite had called to granite, and in truth the job appeared to be one at which that particular boy, like Kipling's painters at their heavenly canvas, could 'work for an age at a sitting and never be tired at all'."

Unfortunately, however, it cannot safely be assumed in such cases that the strong vocational interest is necessarily accompanied by a corresponding aptitude, that the attraction of the work is due to the operation of some mysterious inner mechanism which infallibly directs the child to his proper sphere in life, and that the only wise course is for him to follow the promptings of his 'instinct'. For often enough, as in the case described below, the instinct is stimulated by only one particular aspect of the occupation, and a relatively unimportant aspect at that.

Case 2.—A boy who could give no reasons for his choice had an eager ambition to become a commercial traveller. In manner he was a little forbidding, and even surly; and he admitted that he was deficient in sociability. He was not a boy whom one could imagine exercising tact or persuasiveness in his dealings with others. When his leisure occupations were discussed, it was found that he spent most of his spare time in exploring London. He loved being on the move and making the acquaintance of new places He had no hobbies of a sedentary kind. It appeared that

[1] *Cf. Industrial Psychology;* Ed. C. S. Myers; London, 1929.

the boy had a strong nomadic tendency, and that this was the explanation of his vocational ambition. If he had become a travelling salesman, he would no doubt have been extremely happy in the *travelling* part of the work. Probably the more important *selling* part would have proved very much less congenial.

Sometimes, indeed, the occupation which most strongly attracts the child appears of all occupations the one in which there is the least possibility of his achieving success. The physical weakling aims at the career of the air pilot or the racing motorist, and the boy of poor intellectual abilities longs to become a prominent politician or a great surgeon. The vocational ambition in such cases appears to be of the nature of a recurring day-dream in which the child throws off his habitual sense of incompetence and enjoys in a delightful world of phantasy the superiority denied to him in the harsh world of reality.

¶ 7. ERRORS OF PARENTS. In many cases the child's expressed desire is merely an echo of the wish of the parents, who sometimes, with the best intentions possible, influence the decision in unfortunate ways. There is many a boy whose vocational destiny may be said, in the words of the definition of mental deficiency, to be apparent "from birth or from an early age", it being simply taken for granted that he will succeed to the successful business or flourishing professional practice established or inherited by his father. The boy follows unquestioningly the easy course, which sometimes proves a path to worthy and satisfying achieve-

ment, and sometimes a veritable *descensus Averni.* It would be well if twentieth century fathers, in considering the carrying on of their work when they themselves are gone, felt something of the apprehension expressed in these words, written more than two thousand years ago:—"I hated all my labour wherein I laboured under the sun, seeing that I must leave it unto the man that shall be after me; and who knoweth whether he shall be a wise man or a fool?"

Sometimes, on the other hand, the father is so obsessed by an exaggerated sense of the disadvantages of his own profession that he ordains that no child of his shall repeat his deplorable blunder. Here again, needless to say, there are possibilities of error. Sometimes the man who has been disappointed in his career sees in his son a projection of his own personality, and in his son's future a fresh opportunity of realising the ambitions that have proved beyond his own powers of attainment; and so the boy is forced to attempt the impossible. Very commonly the parental eyes are fixed on the attractions (or what are conceived to be the attractions) of the work rather than on the individual characteristics of the child. A "safe" occupation is chosen because the *father* has the "safety-first" temperament, and we have the pathetic spectacle of a born journalist endeavouring to make himself an efficient bank clerk. Or a post with 'good prospects' is selected for a dullard who will never be able to win the financial prizes that his parents find so attractive. It is probably true to say that in Scotland many a boy has entered the Church mainly because his worthy mother, perhaps some months before she gave him birth, decided

that that was the supremely 'noble' vocation. And there is the less estimable mother who holds strong views on what she considers ignoble vocations and whose social snobbery is the main influence that shapes her daughter's future; and so the girl with the makings of a perfect nurse is doomed to the typing of letters in a Mayfair house, where she is sure to meet only "nice people".

When parents do consider the individual constitution of the child, they commonly err, as does the child himself, in taking a far too limited view, fixing their attention merely on one or two outstanding qualities. But even if their survey were more comprehensive and systematic than it commonly is, they would often fail as vocational advisers through sheer lack of knowledge or of capacity. Usually they are not very accurately acquainted with the ever-changing conditions of the world of work (there is scarcely an occupation under the sun that one parent or another, repeating a baseless rumour, has not described to the writer as "hopelessly overcrowded"); and often they are deficient in some of the characteristics which make for sympathetic understanding of the child. In Mr. Van Druten's play, *Young Woodley*, there is a father who, when his boy is about to leave the public school, feels that it is time that they were getting to know each other, so he decides to go out golfing with the boy and to "take him into the business"; but one feels that his best endeavours to achieve intimacy with his son are not likely to be very successful, for the boy happens to be a poet with an addiction to the verses of Swinburne, while the father is a hard-headed business man

whose chief interest appears to lie in the manufacture of soap. Such incompatibilities are not infrequent, and they do not facilitate the rôle of the family in vocational guidance. As for the great mass of working-class parents, it is obvious that limitations of knowledge, experience and ability must often make it impossible for them to offer wise counsel. In many cases they accept chance opportunities without serious regard to their suitability; and in many cases they allow children who deserve a better fate to drift into blind-alley occupations, more heedful of immediate gain than of future advancement. If the weaknesses, rather than the merits, of the parent are here emphasised, it is not because the writer believes that a child's vocational choice should be no concern of his father and mother. The intention is merely to suggest that the unassisted parent must often be a poor adviser indeed.

¶ 8. LIMITATIONS OF THE TEACHER. The teacher's opportunities of observing the child's characteristics are in some ways unequalled, but his knowledge is often imperfect and one-sided. His limitations are made sufficiently clear by the vagueness of the terms in which his vocational suggestions are commonly phrased:—thus, "a promising boy for a trade", "well fitted for an artisan", "should make a good workman", "good for anything except office or similar work". As indications of occupational potentialities such statements are practically useless. So far as the writer has observed, the pupils of the British public and secondary schools do not very commonly seek vocational advice

from their masters and mistresses; and the latter are usually ready enough to admit that they are not very competent to offer it. Recently numbers of schools have appointed 'careers masters' who, in addition to their ordinary teaching work, are charged with the duty of helping boys to obtain suitable employment; and much useful assistance of a similar kind is rendered to graduates by the appointments boards of the universities. At present, however, the emphasis is generally placed on the finding of the posts rather than on the precise estimation of the capabilities of the candidates.

¶ 9. THE EDUCATIONAL SIEVE. In a sense the educational machine acts automatically as a guidance agency; for the range of occupations open to an individual depends on the education he has received and on the extent to which he has profited by it. The dull child who has been unable to win a place in the secondary school is in no danger of attempting a higher professional occupation which would prove altogether beyond his capacity. But the educational sieve is a very rough one indeed; and among the numerous callings that may be adopted by the child of even the most limited scholastic attainments there are ample opportunities of mistaken choice. Moreover, the system of selecting candidates for free places in technical schools by means of a purely academic examination is calculated to encourage vocational maladjustment; for the ambitious parent, regarding any form of continued education as preferable to none at all, gladly accepts the opportunity of having his bright

boy, who would have made a very competent salesman, turned into a very incompetent engineer.

¶ 10. DEFECTS OF PUBLIC ADVISORY AGENCIES. In recent years, as a result of a growing realisation of the human and economic wastage due to the carelessness with which young people choose their occupations, public employment agencies have been established in many countries for the purpose of aiding the adolescent in the transition from school to industry. In Britain this work is under the central control of the Ministry of Labour, but is organised locally in many areas by the education authority. The first British employment bureau was established by the local authority in Edinburgh in 1908 (the same year in which the celebrated Frank Parsons opened the first American bureau in Boston); and choice of employment schemes are now in operation throughout the country in practically all industrial areas of any considerable size. The needs of the elementary school child are chiefly catered for, although a considerable number of secondary school pupils receive the benefits of the system. It has been estimated that only 20 per cent. of the juvenile workers in England and Wales are actually placed in employment by the public agencies,[1] but the percentage of children who are given advice is very much larger.

The children who are about to leave school are commonly interviewed individually at a conference which is attended

[1] *Cf. Report of the Committee on Education and Industry (England and Wales);* London, 1926.

by the head teacher, by representatives of the official juvenile employment services, and by other persons interested in the welfare of the young worker. Before the conference is the child's 'school-leaving form', on which the head teacher has entered particulars of his attainments and character and a brief note (copied from the school medical records) of his medical condition. This information is neither very comprehensive nor very exact. The position occupied by the child in the school is not a very reliable indication of his attainments, promotion often depending more on age than on capacity; and, even if an exact assessment of scholastic proficiency were available, it would be a poor enough criterion of the child's industrial potentialities. The teacher's remarks on temperament and character are commonly somewhat meagre and of the vaguely laudatory order, useful as a testimonial but of little value as a revelation of the child's individual peculiarities. The medical information may be many months out of date, and is often expressed in vague or technical terms which render it of little assistance to the lay person. For the rest, the conference relies on general observation in a brief and more or less casual interview, during which the child may be almost inarticulate in the presence of half-a-dozen persons who are very kind but completely strange.

The dearth of accurate information is so serious that, in the absence of marked physical or mental defects which obviously render the desired occupation inappropriate, the child's own expressed wish (or that of his mother, who often accompanies him) commonly carries the day. If the

child has no particular plan, the representative of the employment exchange, who has much useful knowledge of local opportunities, does her (or his) best to provide one. But, "with great respect for her ability and sympathy and tact, it must be said that her suggestions are often shots in the twilight, if not in the dark. 'What about leather case-making?' she may say, when Tommy has declined to consider a number of other possibilities—'that's a fine trade for a smart boy like you. Don't you think it would be nice to make suitcases and attaché-cases and that kind of thing?' And she smiles so patiently that Tommy would be a churl to repeat 'No, Miss' any longer. So Tommy says, 'Yes, Miss', and it may be that five years later we shall find him a happy and successful maker of leather cases. Yet, for any considerable voice that reason had in the matter, he might as well have become a maker of steam-rollers or of wedding-rings".[1]

The more one sees of the ways in which boys and girls, helped or hindered by their ordinary advisers, arrive at their vocational decisions, the more fully does one realise the truth of these much-quoted words of Pascal:—"*La chose la plus importante à toute la vie est le choix du métier; le hasard en dispose*". That the need for an improved technique of guidance is real and urgent cannot be questioned by anyone who has any knowledge of the facts. To describe certain recent attempts to meet that need, by the use in vocational guidance of special methods devised by the psychologist, is the purpose of this book.

[1] *Cf. Industrial Psychology;* Ed. C. S. Myers; London, 1929.

CHAPTER II

MEASURING INTELLIGENCE

¶ 1. INDIVIDUAL PSYCHOLOGY. It is not so long ago that psychology would have been appealed to in vain for assistance in the assessment of mental abilities. All down the ages the study of the mind has been a somewhat speculative study, with an interest more academic than practical. Examining his own mental operations by what he called the process of 'introspection', the psychologist attempted to describe the functioning of mind in general, enumerating the capacities or 'faculties' which are common to all men, but not troubling to investigate the ways in which individual men differ in respect of these capacities. No doubt the fact of variation in mental characteristics has been obvious enough since the time when men first began to observe the behaviour of their fellows; but until comparatively recent years no efforts were made to study that variation experimentally, or to subject it to measurement.

All this has been changed, and there is now an important branch of psychology which is designated the 'psychology of individual differences' and has a very practical bearing on the problem of occupational guidance. There is of course no distinctive brand of psychology which can be labelled 'vocational'. The characteristics which a man brings to his work are just those which he exhibits in the activities of life generally; and the estimation of occupational fitness is merely one of a number of fields of endeavour in

which individual psychology is now being tentatively applied. The literature on individual differences is already immense, and therein the reader must seek full details both of theoretical discoveries and of practical methods. Only a brief summary of the matter can be attempted here.

¶ 2. EARLY EXPERIMENTS IN MENTAL MEASUREMENT. Attempts to measure mental capacity were made in the closing decades of the nineteenth century, but with somewhat disappointing results. The early investigators used methods and instruments which, although often complicated enough in themselves, were designed to test the simpler mental functions, such as those, for example, which are involved in distinguishing fine differences in sensations of brightness or of weight, and in 'reacting' speedily to a sensory stimulus by making a prescribed muscular movement. The performances of the individuals who were set these elementary tasks were found to show little correspondence with their performances in other activities, such as scholastic learning, which are commonly regarded as intellectual. Indeed, when tested with the æsthesiometer, an instrument for measuring the sensitivity of the skin to tactual stimuli, civilised Europeans were discovered to be actually less gifted than members of a savage tribe; and so, as Ballard has put it, the æsthesiometer proved to be "merely an æsthesiometer and not a phrenometer: it measured sensitivity, but not sensibleness".[1]

[1] *Cf.* P. B. Ballard; *Mental Tests;* London, 1923.

¶ 3. THE TECHNIQUE OF CORRELATION. In the early years of the present century notable advances were made, chiefly as a result of the work of Spearman and Burt in England and of Binet in France. Spearman's first contribution consisted in the elaboration of the mathematical technique of correlation, a technique which was originally devised for the study of physical measurements and has proved invaluable in the psychological field. Correlation is a device for calculating the extent to which two series of measurements vary together, the degree of concomitant variation being expressed as a numerical coefficient which ranges between the extreme values of + 1.00 and — 1.00. For example, suppose that a number of individuals are measured in respect of height and weight and that the correlation formula is applied to the figures so obtained. If there is a perfect relationship between the two series of measurements, superiority in height invariably being accompanied by an exactly corresponding superiority in weight, then the correlation coefficient will work out at + 1.00. If there is no relationship at all, the coefficient will be zero. If the individuals studied happen to form a remarkably freakish group, so that there is a perfect correspondence, not between tallness and heaviness, but between tallness and lightness, then the figure will be — 1.00. And if the group constitutes a representative sample of the general population the coefficient will have none of these three values; it will be positive and fairly high but it will scarcely approach unity; for, although height and weight are fairly closely connected, the taller of two persons is not necessarily the heavier.

When a positive correlation is found, the logical conclusion is that the two connected characters are causally related, either directly or through some character on which both depend. Applied to the results obtained by a group of individuals in two different mental tasks, correlation makes possible an exact estimation of the extent to which success in the one task is accompanied by success in the other, and therefore of the extent to which success in the two tasks is dependent on one and the same ability.

G. 4. THE TWO-FACTOR THEORY OF MENTAL ABILITIES. Now, when Spearman, with the aid of his more refined statistical technique, studied the scores obtained in mental tests of the early sensory-discrimination type together with the marks gained by the testees in various school subjects, he found correspondences which the previous investigators, owing to the crudity of their methods, had failed to detect. And as a result of his observations, he put forward tentatively, in 1904,[1] his famous 'two-factor' theory. According to this theory, mental abilities are not independent, but are connected by a 'general factor' which occurs in them all. But this general factor (to which we may give the familiar name of 'intelligence' although Spearman dislikes the word) is not the sole factor; otherwise all abilities would be equally and perfectly correlated. There are, in addition, numerous 'specific' factors which vary from one ability to another and are almost entirely independent.

[1] *Cf.* C. Spearman; "'General Intelligence' Objectively Determined and Measured"; *American Journal of Psychology;* Vol. XV, 1904.

¶ 5. EXPERIMENTS OF BURT. This early work of Spearman gave a fresh impetus to the development of mental tests and, in particular, led directly to certain classical experiments conducted by Burt. Working in Oxford among pupils of an elementary and a preparatory school, Burt used a series of twelve tests which included, in addition to tests of sensory efficiency, others demanding rather more complex mental processes.[1] One of the latter was the 'spot-pattern' test, in which a field marked off into squares and containing a number of dots placed irregularly at intersections of the lines was exposed for a very short time, the measure of ability being the number of exposures necessary before the child could reproduce the pattern correctly. Applying Spearman's correlational methods, Burt found fresh evidence in favour of the theory of the general factor; there appeared to be a single ability entering into all the tests, simple and complex. The more complex operations, however, were found to be more closely related to one another than were the simpler tasks, and they also showed a higher correlation than did the latter with an independent criterion of intelligence in the form of estimates made by the teachers. In short, they appeared to be the better tests of intelligence.

These conclusions were confirmed in a later experiment[2]

[1] *Cf.* C. Burt; "Experimental Tests of General Intelligence"; *British Journal of Psychology;* III, 1, 1909.

[2] *Idem*; "Experimental Tests of Higher Mental Processes and their Relations to General Intelligence"; *Journal of Experimental Pedagogy*, 1911, I, 2.

conducted by Burt in Liverpool, in which he used tests designed to tap even higher levels of the mind—for example, the 'analogies' test, which demands the ability to detect logical relationships between the meanings of words. Again the results showed that the tasks which common sense regards as the more 'intellectual' were in fact the better tests of intelligence. Moreover, Burt found that these higher abilities appeared to be possessed by children in much the same degree as by their parents, and he therefore concluded that they were inborn and not acquired. Thus he reached a definition of intelligence as "inborn general intellectual efficiency".

But it is not enough to discover that a particular test is a good test of intelligence. Burt knew that the children who excelled in his reasoning problems were more intelligent than those who proved less successful, but just *how* bright were the bright children, and *how* dull the dull children, he had no means of ascertaining. Comparing the scores obtained by two individuals in a mental test is like comparing the heights of two individuals as shown by notches cut on an ungraduated stick. In the one case as in the other the instrument may be used to demonstrate relative superiority or inferiority; but if one wishes to *measure* superiority and inferiority one must invent a scale.

¶ 6. THE WORK OF BINET. To a French psychologist, Alfred Binet, belongs the honour of having first devised a scale for the measurement of mental capacity. While Spearman and Burt in England were busily engaged in

proving the existence of general ability, Binet, with his collaborator Simon, was faced with the practical problem of assessing the *degrees* of general ability possessed by particular individuals; namely, Parisian school children suspected of mental deficiency. Binet began by constructing a heterogeneous group of test problems, among which were some demanding the exercise of the higher reasoning powers of the mind. Then, having made his tests, he proceeded to ascertain how difficult they were by applying them to children of different ages, and noting, for each particular problem, the percentage of successful solutions at each particular age. In this way Binet discovered what kinds of task the normal or average child is capable of performing at the various age levels. He no longer had a miscellaneous collection of problems of unknown difficulty; he was able to arrange his problems in a graduated age scale. Then, when he gave his tests to any particular child, he could assess the performance by exact standards, ascribing to the child a 'mental age' corresponding to the highest point on the scale at which the problems were solved correctly. For instance, a child of whatever age who passed all the tests normally passed at age seven, but failed in the tests for age eight, was said to have a mental age of seven years.

The invention by Binet of this ingenious, yet simple, device was of momentous importance for the development of the new science of mental measurement, and it has been acclaimed as one of the most notable achievements in the whole history of psychology. But the mental age is no

indication of brightness or dullness unless considered in relation to the actual age; and later investigators improved on Binet's method by expressing the mental age as a percentage of the actual age, the resulting figure being known as 'mental ratio' or 'intelligence quotient' ('I.Q.'). In the case of the average child the mental age is, by definition, exactly equal to the actual age, and the mental ratio is therefore 100. In the generally accepted classification of mental ratios, however, a ratio between 90 and 110 is regarded as falling within the limits of average intelligence. The child below 90 is definitely dull and the child below 70 is usually 'feeble-minded'. It has been estimated that only one child in a hundred has a mental ratio as high as 130, and ratios above 150 are very rare.

The Binet-Simon Scale was first published in 1906. A second version appeared in 1908, and a third in 1911, in which year Binet died, leaving his labours uncompleted. The work was taken up enthusiastically in various countries (notably in America) and a number of further revisions and extensions of the Scale were prepared. The best known and most widely used of these is the Stanford Revision,[1] by Professor Terman, of Stanford University, who not only laid down very detailed and precise rules for the giving and scoring of the tests, but also added many valuable new problems.

In England Burt[2] published a revision of the Scale which

[1] *Cf.* L. M. Terman; *The Measurement of Intelligence;* London, 1919.

[2] *Cf.* C. Burt; *Mental and Scholastic Tests;* London, 1921.

was less ambitious than Terman's. Probably the most suitable version of the tests for British children is that published in a recent government report[1] and based on a re-standardisation by Burt of the Stanford Revision.

The tests are mainly of the oral question-and-answer type, the examination being a refined and elaborately standardised interview. One of the tests for age eight, 'Giving Similarities', will serve as an illustration of the method. The examiner says:—"I am going to tell you two things which are like each other in some way, and I want you to tell me in what way they are like each other. Any way will do—quite a simple way". The pairs of words used are wood and coal, apple and orange, brass and silver, ship and motor car; and the test is passed if the child gives any real similarity in two of the four comparisons.

The Binet Scale remains a valuable, if imperfect, instrument for the measurement of mental capacity in the young or backward child, and it is in constant use throughout the civilised world for the diagnosis of mental deficiency; but it is not usually the most appropriate test of intelligence for children of school-leaving age, and it is included in the vocational examination of only the dullest of such children.

¶ 7. THE AMERICAN ARMY EXPERIMENT. One of the disadvantages of the Binet tests, which must be given to each child individually, lies in the length of time required for their administration. When it is desired to examine a considerable number of individuals it is obviously of con-

[1] *Cf. Report of the Mental Deficiency Committee;* London, 1929.

venience to use a test which the group can perform together. 'Group' tests of intelligence, in the form of paper-and-pencil exercises, were first applied on an extensive scale during the Great War, when the American Army authorities decided to examine the mental capacity of their recruits, in order to discover those who might prove suitable for promotion and to eliminate those who were not sufficiently intelligent to be trusted with a lethal weapon. The Army group tests[1] were prepared by a committee of leading American psychologists, but contained types of problems invented by workers in other countries; for example, the 'analogies' test of Burt. The number of recruits examined was nearly two million.

8. DEVELOPMENT OF GROUP TESTS. As a result of this impressive experiment, group tests of intelligence, following more or less closely the American Army model, soon began to be used very extensively in the post-war period.[2] They were found valuable in schools and colleges, where they enabled teachers to judge what sort of educational achievement was to be expected of individual pupils and to diagnose the causes of scholastic failure; to discover whether the backward child was also a dull child or whether, for one reason or another, his attainments fell short of his capacity. An obvious extension of this work was the use of intelligence tests in vocational guidance, and nowadays

[1] *Cf.* C. S. Yoakum and R. M. Yerkes; *Mental Tests in the American Army;* London, 1920.

[2] For examples of test problems *cf. infra*, p. 36.

the tests are so used in most civilised countries, although as yet they have found no place in the practice of the official guidance agencies of Britain.

Much of the testing carried out during the first quarter of the present century was somewhat empirical and lacked a secure theoretical basis. The authors of the tests included such problems as they *thought* to be good measures of intelligence, and then attempted to establish the validity of these measures by correlating test scores with teachers' estimates. But teachers' estimates of intelligence are not very reliable; indeed, if the test scores and the estimates yielded an extremely high correlation (as they usually do not), one would be forced to regard the test as suspect.

¶ 9. SPEARMAN'S RESEARCHES. While these practical developments were taking place, Spearman and his pupils were continuing their laborious researches into theoretical principles; and the results of these researches have been published in two very important books.[1] Spearman suggests that the recent vast activity in the field of mental testing was inspired by his two-factor hypothesis, first published in 1904; but he complains that Binet and his followers have not taken the trouble to understand the implications of the two-factor theory. Their practice has indeed been fairly sound, but that has been a matter of luck rather than of judgement. On the theoretical side they have tried to get away too cheaply. It is true that they attempted

[1] *Cf.* C. Spearman; *The Nature of Intelligence and the Principles of Cognition;* London, 1923; and *The Abilities of Man;* London, 1927.

to define what they meant by intelligence, but their definitions showed a marked lack of agreement, and their practice (which was not always very closely related to their theory) also varied considerably. One psychologist defined intelligence as the power of adaptation to new situations, another as the capacity to learn, another as the power of abstract thinking, another as the power of mental analysis and synthesis—and so on. Spearman insists that, if mental testers are to escape from this confusion and achieve the highest possible accuracy in their measures of capacity, they must build up their practice on a more solid theoretical foundation; and this foundation he claims that he has been able to supply.

Spearman, as has been said, began by applying the method of correlation to the measurements of different abilities, and he found that the various abilities tested showed a more or less close correlation among themselves. Further, when he looked at his correlation coefficients with a mathematical eye, he noticed that they tended to form an orderly system or 'hierarchy'.[1] Having observed this phenomenon, Spearman sought the explanation of it; and, by a process of mathematical reasoning, he arrived at the conclusion that when (and only when) a table of intercorrelations exhibits the hierarchical arrangement, then each measurement of each of the abilities tested is divisible into two parts. "The one part has been called the 'general factor' . . .; it is so named because, although varying freely from individual to individual, it remains the same

[1] *Cf.* note at end of this chapter, page 47.

for any one individual in respect of all the correlated abilities. The second part has been called the 'specific factor' . . . It not only varies from individual to individual, but even for any one individual from each ability to another".[1] Neither the general nor the specific factor is necessarily a unitary thing; both may be composite in their nature.

The next step was to prove the 'universality' of the general factor; to show that it was really 'general' by discovering its presence throughout the whole field of 'cognition' (the term traditionally employed to distinguish the *thinking* processes of the mind from the *feeling* and *willing* aspects of mental activity). But before attempting this Spearman produced a new psychology of cognition. Examining the separate 'faculties' of the older descriptive psychology—conception, reasoning, imagination, and the like—he concluded that they could be reduced, in the last analysis, to certain fundamental and unifying "principles of cognition"[2] which account for all cognitive activity whatever, "from the loftiest flight of genius to the prattle in the nursery".

Having made his new map of the mind, Spearman proceeded to explore it, with the aid of his statistical criterion, for the presence of the general factor; and he found that the influence of this factor is all-pervasive, or nearly so. Almost without exception, the inter-correlations of a series of mental tests show the hierarchical arrangement, no matter what types of thinking are demanded by the

[1] *Cf.* C. Spearman; *The Abilities of Man;* London, 1927.

[2] *Cf.* note at end of this chapter.

tests included in the series. And so Binet and his followers, in adopting the principle of the heterogeneous pool of tests, were doing better than they knew. Their tests, which they imagined to be measuring an intelligence conceived as some special mental faculty—of 'abstract thought', or 'learning', or 'adaptability'—were in fact measuring Spearman's general factor, which was the same for all the tests, plus a number of specific factors, which varied from one test to another; but, if the tests were of a sufficient number and sufficiently varied in character, the effect of combining them in the pool was to make the influence of the general factor preponderant. In the aggregate the specific factors tended to neutralise one another, and the total score was a crude—often a far too crude—approximation to a measurement of the general factor. In short, Spearman claims that the undoubted success achieved in the measurement of intelligence has been due to the fact that the testers have assimilated his own doctrines far more than they acknowledged or even knew, the two-factor theory having been implicitly recognised in their usual procedure of testing.

But although intelligence enters into all our thinking, it enters more fully into some kinds of thinking than into others. The relative importance of the general factor and the specific factor varies considerably from one ability to another; and Spearman has provided a method whereby the weight of the two factors may be calculated. Therefore, in estimating the value of any particular type of problem as a measure of intelligence, we need no longer depend (so

Spearman maintains) on the old-fashioned method of correlating the test score with a criterion so imperfect as the estimate of the teacher. We can apply an exact mathematical criterion to determine how far the mental activity involved in the solution of the problem is 'saturated' with intelligence; and only by applying this criterion and selecting, with its aid, those kinds of mental activity which are the most highly saturated with intelligence can we hope to make our tests as effective as possible. Spearman, then, believes that he has furnished the means of introducing into the practice of intelligence testing a very considerable degree of scientific precision; indeed, he claims that, in his principles of cognition, "the so long missing genuinely scientific foundation for psychology has at last been supplied, so that it can henceforward take its due place along with the other solidly founded sciences, even physics itself".

¶ 10. THEORETICAL CONTROVERSY. Psychologists cannot be said to have received these discoveries at once with the acclamation which they would seem to deserve if Spearman's estimate of their importance is a true one. The admixture of metaphysics and mathematics in Spearman's writings makes his theories somewhat difficult of assimilation; and the author might with some justice complain that, on the whole, his new psychology of cognition has met with the fate which Kant predicted for the *Critique of Pure Reason*:—"it will be falsely judged because it is misunderstood; it will be misunderstood because people, though they may care to turn over the leaves of the book, will not

care to think it out; and they will be unwilling to expend this trouble upon it because the work is dry, obscure and opposed to all accustomed conceptions".

In America the theory of the general factor has been contested by Thorndike, one of the pioneers of the mental testing movement, whose early investigations led him to believe that mental abilities were highly particularised and independent. Thorndike, however, has modified this extreme view, and in his latest book[1] he appears, as Spearman has pointed out,[2] to have taken important steps towards reconciliation with the latter's theories. In Britain the chief antagonist has been Thomson,[3] who, while he has not questioned the validity of Spearman's mathematical interpretation of the correlational hierarchy, has argued that this is not the only possible interpretation. Thomson has sought to show that the correlations observed between mental tests may be explained by 'group' factors, which are less wide in their range than Spearman's general factor and less narrow in their range than Spearman's specific factors, each group factor linking together a certain limited number of mental abilities. On Thomson's theory the intelligence test measures a person's 'general' ability by calling into play a 'sample' of numerous independent factors which, in varying but overlapping combinations, are

[1] *Cf.* E. L. Thorndike and others; *The Measurement of Intelligence;* New York, 1927.

[2] *Cf.* C. Spearman; "Critical Notice of 'The Measurement of Intelligence' "; *British Journal of Psychology;* XVII, 4, 1927.

[3] *Cf.* W. Brown and G. H. Thomson; *The Essentials of Mental Measurement;* Cambridge, 1921.

involved in his several intellectual activities, rather than a general factor common to all his intellectual activities. There has never been any disagreement regarding the fact that an individual who succeeds in one kind of mental work tends to succeed also in other kinds; where Spearman and Thomson have differed is in their explanations of this fact. From recent discussions, however, it would appear that the disputants, if they have not yet achieved complete harmony, now recognise that the two theories are not incompatible with each other.[1] Meantime, those psychologists who are not sufficiently expert in mathematics to follow the intricacies of the argument find comfort in the fact that, whatever may be the ultimate nature of intelligence, there is close agreement as to the procedure by which intelligence may best be measured, the tests used by the rival theorists being remarkably alike.

¶ 11. TYPICAL TEST PROBLEMS. The following are some of the types of problem commonly included in the group test of intelligence. The list is by no means an exhaustive one.

1. *Analogies.* Three words are given, of which the first two are related in some way. The problem is to find a fourth word which is related to the third in the same way in which the second is related to the first. The subject is usually required to indicate the solution by marking with

[1] *Cf.* W. Brown and G. H. Thomson; *The Essentials of Mental Measurement*, 3rd ed.; Cambridge, 1925; and C. Spearman; "The Theory of 'Two Factors' and that of 'Sampling' "; *Brit. J. of Ed. Psych.*, I, 2, 1931.

his pencil the answer which, of a number of possible answers supplied, he considers the best.

Examples:—

(1) Large is to small as heavy is to (*short*, *little*, *weight*, *light*).

(2) Dog is to spaniel as tree is to (*plant*, *oak*, *branch*, *animal*).

(3) Artist is to picture as author is to (*words*, *reading*, *book*, *ink*).

2. *Synonyms and Antonyms.* One word is supplied and the subject is required to select a second word which has the same or the opposite meaning. Or two words may be given, the task then being to indicate, by underlining either 'same' or 'opposite', whether the two are synonyms or antonyms.

Examples:—

(1) Large means the same as (*heavy*, *big*, *amount*, *extreme*).

(2) Love is the opposite of (*charity*, *cruelty*, *anger*, *hate*).

(3) Believable and incredible are (*same*, *opposite*).

3. *Classification.* Among a number of words supplied the subject is required to detect one which does not belong to the same category as the others.

Examples:—

(1) *head*, *hat*, *hand*, *arm*, *leg*.

(2) *selfish*, *kind*, *pretty*, *truthful*, *lazy*.

(3) *wave*, *gale*, *brave*, *save*, *grave*.

4. *Number Series.* A series of numbers is given and the problem is to discover the rule determining the sequence and to select, from an additional row of numbers supplied, the two that 'come next'.

Examples:—

(1) 3, 6, 9, 12 (18, 21, 24, 15, 30, 27).
(2) 20, 15, 11, 8 (1, 2, 3, 4, 5, 6).
(3) 2, 4, 4, 8 (2, 8, 4, 12, 32, 16).

5. *Mixed Sentences.* A sentence is given in which the words have been disarranged. The subject is required to discover the correct order of the words and to indicate whether the statement contained in the re-arranged sentence is true or false.

Examples:—

(1) Seven days a week are in there (*true*, *false*).
(2) In never overcoming helps difficulties perseverance (*true*, *false*).
(3) Cricket and tennis ball is in exactly the used kind of golf same (*true*, *false*).

6. *Completing Sentences.* A statement, containing one or more sentences, is given, at various points in which alternative words are printed. The task is to indicate, where these options are given, the words which must be used if the whole statement is to read sensibly.

Examples:—

(1) A (*deaf*, *blind*, *hungry*) man cannot (*see*, *eat*, *walk*).
(2) It may be admitted that an act of (*suicide*, *self-*

sacrifice, *generosity*) is always (*good*, *foolish*, *criminal*), but there are many ways in which a man may (*indulge*, *kill*, *sacrifice*) himself, and he is (*responsible*, *arrested*, *punished*) for choosing the most (*painful*, *wicked*, *useful*).

7. *Reasoning*. The nature of this test is sufficiently illustrated by the following examples:—

(1) Tom is older than Dick but younger than Harry. Who is the youngest?
(*Tom*, *Dick*, *Harry*.)

(2) There are a hundred boys in this school. Sixty are lazy, fifty are Irish and forty are stupid.
(*a*) Are any of the Irish boys lazy?
(*yes*, *no*, *impossible to say*.)
(*b*) Are any of the boys neither lazy nor stupid?
(*yes*, *no*, *impossible to say*.)

The above problems are not invariably presented in the forms shown, various modifications being used. In the analogies test, for example, the ' true-false' method may be employed instead of the 'multiple response' method; or a reasoning problem may be given in the form of an exercise in sentence completion. Further, in tests such as analogies, synonyms, and number series, an 'inventive' response may be called for, the subject being required to supply the correct answer instead of selecting it from a number of answers provided. The sentence completion test was originally used in this form; the examinee was shown a prose passage containing a number of blank spaces in which

he was asked to fill in the missing words. Usually, however, the 'selective' method is preferred, as this makes for ease and objectivity of scoring; the answers are clearly right or clearly wrong, and the marking is entirely unbiased by the 'personal equation' of the examiner.

The group test is a printed booklet which is usually made up of five or six sections or sub-tests, each sub-test containing a fairly large number of problems of one particular kind. The problems in each section are graded in difficulty, the subject proceeding from the easier to the harder. For example, a test constructed by Burt[1] consists of 50 same-opposite problems, 25 analogies, 30 mixed sentences, 30 sentence completion problems and 18 problems of reasoning. In this test the subject indicates the solutions merely by underlining particular words or phrases or figures, and, some of the problems being multiple, approximately 200 strokes of the pencil are called for. Each correct stroke is awarded one mark. The subject is told to work as quickly as possible; and there is a definite time allowance for each section of the test, the allowance being such that the brightest individual can scarcely complete any section. The total time occupied is about thirty minutes.

Sometimes the different parts of the intelligence test are not separately timed, although there is a fixed time allowance for the test as a whole. In this so-called 'omnibus' type of test the material is usually arranged in cycles, a series of five or six short sections being followed by a second series containing similar problems, and this again

[1] Group Test No. 33; National Institute of Industrial Psychology.

by a third series and perhaps a fourth. This method ensures that the subject attempts every kind of problem, even if he is unable to complete more than a third of the entire test in the time allowed.

¶. 12. TEST CONSTRUCTION AND STANDARDISATION. It will be obvious to the reader that any averagely intelligent person is capable of constructing problems such as those described above. But the preparation and standardisation of a good intelligence test is a long, laborious and expert operation; and it is not work for the enthusiastic amateur. The original invention of the items is only the beginning of the process. It is necessary to 'try out' the test repeatedly in order to detect faults in the material and to investigate such matters as the relative difficulty of the problems, the difficulty of the test as a whole for the ages for which it is intended, and the effect of varying the time allowances. Finally the test must be applied to a large and thoroughly representative group of individuals in order that accurate norms may be established.

Age norms, as originally used by Binet, are commonly employed; the score is converted into a mental age and the mental ratio is then calculated by division of the mental age by the actual age and multiplication of the result by 100. To save the examiner the trouble of this calculation some authors of tests provide a ready-reckoner with the aid of which, knowing a child's age and score, one can immediately discover his mental ratio.

It has been found that intelligence develops evenly

throughout childhood, the mental ratio remaining relatively constant from year to year, but that there is no appreciable growth in general capacity above the age of 16. Consequently, the averagely intelligent adult has a mental age of 16; and in the calculation of his mental ratio his actual age must be taken as 16 also. A difficulty arises, however, in the case of the *more than averagely* intelligent person at or above the age of 16. For his capacity is of a higher degree than a mental age of 16 would indicate, yet we cannot say that he has a mental age of 17 or 18; there is no such thing as a mental age of 17 or 18, the average person at these ages having a mental age of 16.

The difficulty is not an insuperable one. For it is known that intelligence is distributed among the population in accordance with the laws of chance, there being just as many individuals at any distance above the average as there are at an equal distance below the average. Consequently, if we find that 25 per cent. of persons aged 16 have mental ratios below 90, we know that there are 25 per cent. with mental ratios above 110. We can then find the test score which is exceeded by only 25 per cent. of persons aged 16, and we can say that that score, when achieved by a person of that age, indicates a mental ratio of approximately 110. And similarly we can determine the other points in the distribution of scores corresponding to the other mental ratios above the normal.

¶ 13. PERCENTILE NORMS. To establish norms in the form of mental ratios it is necessary to apply the test to a very

large group of individuals, containing members of the various social classes in the same proportions in which they are found in the total population. For the higher social classes have the higher average intelligence, and only if a truly representative sample of the general community is tested can accurate standards be obtained. In vocational guidance, however, it is sufficient to discover how an individual stands in relation to his own group; how, for example, a secondary schoolboy of 16 compares with secondary schoolboys in general at that age. And for this purpose a relatively simple method of standardisation is commonly used, the score being converted into a figure which indicates its *percentage frequency* in the group to which the individual belongs. For example, a boy whose score exceeds the scores of only 25 per cent. of boys of his own age and education, and is equalled or exceeded by the scores of the remaining 75 per cent., is said to have a 'percentile rank' of 25. If 90 per cent. of the scores fall short of his performance, he has a percentile rank of 90. And so on. The preparation of a table of percentile norms is a comparatively easy matter; and any individual's rank can immediately be read off as soon as his test score is known. The method is a little puzzling to those unfamiliar with it; but there is much to be said in its favour. It provides a very clear and concrete notion of an individual's position, among comparable individuals, in respect of any ability tested.[1]

[1] The reader will find a good introduction to psychological statistics in H. E. Garrett; *Statistics in Psychology and Education;* New York, 1926.

A percentile rank is of course a very different thing from a percentage mark. The statement that a boy has gained 75 per cent. of the possible marks in a test conveys no exact indication of the quality of his performance. The mark may be a very good one or a very indifferent one; it all depends on the difficulty of the test. A percentile rank of 75, on the other hand, can have only one meaning, and its meaning is very definite and precise. It indicates that the boy is superior to 75 per cent. of his fellows, so that in a representative group of 100 he would be 25th in order of merit.

¶. 14. VALUE AND LIMITATIONS OF TESTS. Intelligence tests are commonly criticised, most commonly by persons who have little understanding of the way in which they are used. They are blamed for failing to measure things which they are not intended to measure; character, for example, and artistic talent. It is as if one were to regard the stethescope as a useless instrument because, although of great assistance in the examination of the heart and lungs, it tells one nothing about the condition of the liver and kidneys. No one claims that the intelligence test is an infallibly exact instrument. It is impossible to obtain complete standardisation of the examination conditions, for these include not only the test problems but also the emotional attitude of the child to the test and to the examiner. But to say this is not to deny scientific validity to the method; it is merely to admit that the method must always remain less exact than the methods of the physical sciences. Most competent judges are agreed

that, in general, the test provides at least a distinctly more accurate assessment of a person's capacity than can be obtained in any other way.

To the vocational adviser the intelligence test is an invaluable aid, for it is important that the intelligence possessed by the individual should be as nearly as possible of the same order as the intelligence demanded by the occupation. The vocational significance of intelligence will be discussed later, but the present chapter may fittingly be concluded with an account of two cases, typical of many, in which the application of an intelligence test resulted in a considerable illumination of the vocational problem.

Case 3.—A boy who had succeeded in matriculating, but *who had not been regarded as possessing any outstanding* ability, was placed in an occupation which demands only modest capacities and which does not normally lead to work of a more exacting kind. He was vaguely discontented with his work, and after a few years his temperamental condition became somewhat abnormal. His father brought him to a psychologist, not for vocational guidance, but for advice as to whether any form of psychological treatment might induce a more cheerful outlook on life. The boy's performance in the intelligence test was a brilliant one; his score compared favourably with the scores usually obtained by highly distinguished graduates engaged in university teaching. The psychologist said that a much more stimulating vocational objective was desirable, and that probably this would prove a sufficient cure. The advice was followed, and the boy, when last heard of,

was studying for a degree at Cambridge, where he appeared to be not only successful, but also entirely happy.

Case 4.—A girl whose school career had been undistinguished, succeeded, after several fruitless attempts, in satisfying the entrance regulations of an Irish university. Her father was a member of a learned profession, and it had not occurred to him as possible that his own gifts had not been inherited by his daughter. True, the girl was backward in her studies, but backwardness may be due to many things other than lack of capacity; for example, it may be the result of inefficient teaching. It was only after two completely unsuccessful years spent at the university that it was decided to abandon the unequal struggle and to seek vocational guidance. The intelligence test showed that the girl's percentile rank, among girls of secondary school education, was below 10. If the test had been applied some years previously, a great deal of unhappiness and misdirected effort might have been prevented.

NOTE TO CHAPTER II

¶ 1. THE TETRAD EQUATION. The orderly system into which the inter-correlations of a series of mental tests tend to fall can be expressed in the following mathematical formula, in which a, b, c and d are used to denote *any four* of the tests, and ab, for example, signifies the correlation between tests a and b.

$$(ab \times cd) - (ad \times bc) = o.$$

This formula Spearman calls the "tetrad equation", and the value constituting the left side of it he calls the "tetrad difference".

As Burt[1] has pointed out, the connection between this equation and the two-factor theory is most easily understood when, instead of reasoning backwards from the mathematical findings to the hypothetical factors which explain these findings, one begins by assuming the existence of the factors and reasons forwards from causes to effects. Suppose, then, that the abilities measured by six different mental tests are connected by a general factor; and that in each of the six abilities there is an additional factor; and that these additional factors are entirely unrelated, so that the correlations between the tests are due to the general factor alone. Suppose further that the six abilities are 'weighted' with the general factor to the extents represented by correlation coefficients of .6, .5, .4, .3, .2 and .1 respectively. Then, since it is a statistical rule that the correlation between two tests which contain a common factor is equal to the product of the separate correlations of the tests with that factor, the inter-correlations of the six tests will be as shown in the following

[1] *Cf.* C. Burt; *The Measurement of Mental Capacities;* Edinburgh, 1927.

table, in which the tests are represented by the letters A to F, and the figures accompanying these letters indicate the correlations of the several tests with the general factor:—

		A .6	B .5	C .4	D .3	E .2	F .1
A	.6	...	.30	.24	.18	.12	.06
B	.5	.30	...	.20	.15	.10	.05
C	.4	.24	.20	...	.12	.08	.04
D	.3	.18	.15	.12	...	.06	.03
E	.2	.12	.10	.08	.06	...	.02
F	.1	.06	.05	.04	.03	.02	...

It is obvious that the values of the coefficients diminish in an orderly way and that the figures in any one column always keep in the same proportion to those in any other. And, no matter which four of the tests are selected, the tetrad equation always holds. If, for example, we take the ABEF tetrad, we find the criterion satisfied, as follows:

$$(.30 \times .02) - (.06 \times .10) = 0.$$

Suppose, however, that tests A and B, in addition to being correlated to the extent of .30 by reason of the general factor, have an additional correlation due to the specific factors being to some extent connected; in other words, suppose that these two tests are related not only by the general factor but also by a group factor. Then the total correlation between the tests will be greater than .30. Consequently, the perfect hierarchy will no longer be found; and in the above tetrad, as in every other

tetrad in which these two tests are included, the equation will not hold.

Spearman, in addition to demonstrating the inevitability of the tetrad equation when divisibility of each of the variables into two factors, general and specific, is assumed, claims to have proved, conversely, that whenever the equation is found to hold, the said divisibility into two factors necessarily follows. In actual practice, owing to experimental errors, the criterion is never perfectly satisfied, the tetrad difference always amounting to some (usually very small) positive or negative value; and special statistical measures must be used in order to determine whether the observed tetrad differences are probably due wholly to chance, or whether group factors are present.

¶ 2. THE PRINCIPLES OF COGNITION. The serious student must consult Spearman's own account of his new psychology of cognition; but a brief note on the subject may be of interest to the more casual reader. Spearman's "principles" are the result of an attempt to map out systematically the whole domain of human thought, in order that light may be shed on the problems of the nature of intelligence and the precise range of its activity. There were maps already in existence, some of them centuries old; but for Spearman's purposes they were not sufficiently scientific. By a process of classification on the merely descriptive level, psychologists had distinguished various territories of thought, such as reasoning, planning, analysing, imagining, and so forth; but a scientific psychology must reduce this apparent diversity to uniformity by discovering the ultimate laws of thinking, laws which (like the first principles of physics) are not deducible from any others more general. Spearman has concluded that there are only three fundamental types of intellectual activity; and these he has defined in his three so-called "qualitative" principles or laws of cognition.

The first law states that "a person has more or less power to observe what goes on in his own mind. He not only feels, but also knows what he feels; he not only strives, but knows

that he strives; he not only knows, but knows that he knows".[1] This principle covers "the apprehension of one's own experience"; and it is to it that we owe "the greater part of ordinary conversation; as when a man remarks 'I was angry at this', or 'I saw something red', or 'I thought of the future' ".[2] To the reader who exclaims that this proposition is so obvious as to be scarcely worth stating it may be replied that the same objection might with equal reasonableness be raised against Newton's first law of motion.

The second law is that of the "eduction of relations". It states that "when a person has in mind any two or more ideas (using this word to embrace any items of mental content, whether perceived or thought of), he has more or less power to bring to mind any relations that essentially hold between them".[3] The items between which the relations obtain Spearman calls the "fundaments". A simple example is the discovery of a relation of likeness between two sensory perceptions. But the fundaments have not necessarily been apprehended in experience by the operation of the first principle. "Though the presented objects may happen to be the wildest imaginative monstrosities, still relations can be cognised between them. A griffin can be clearly known to be different from a unicorn, in spite of neither the one nor the other having really existed at any time".[4] The word "eduction" is used to distinguish this type of knowing from the process of apprehension. Here the knowledge has an immediate source other than lived experience. The relations are "drawn out" from the very nature or essence of the items present in the mind, whether the actual existence of these is possible or impossible. The fundaments from which the relations are educed may be of any degree of complexity. They may themselves be relations, as when a likeness is seen between the

[1] *Cf.* C. Spearman; *The Abilities of Man;* London, 1927.

[2] *Ibid.*

[3] *Ibid.*

[4] *Idem; The Nature of Intelligence and the Principles of Cognition;* London, 1923.

temporal relation of January to February and that of August to September.

The third law, which is that of the "eduction of correlates", states that "when a person has in mind any idea together with a relation, he has more or less power to bring up into mind the correlative idea".[1] For instance, in the Opposites test, the idea of 'goodness' and the relation of 'oppositeness' generate the correlative idea of 'badness'. In the Analogies test the joint operation of the second and third principles is seen; for example, the relation of oppositeness is first educed from the ideas 'good' and 'bad', and from this relation and the idea 'white' there is then educed the correlate 'black'.

A specially notable virtue of the third principle is that it enables the mind to transcend all experience. Given the ideas of the griffin and the unicorn, one may educe a relation between them by means of the second law; but if it were not for the third law these ideas would never have been given at all. The eduction of correlates is conspicuously present in thinking of an imaginative kind. Indeed, Spearman maintains that in the transplanting of an old relation, and the consequent generating of a new correlate, is to be found the essence of all artistic creation. Consider, for example, "the soulless monster of Frankenstein who, after being put together out of fragments of men picked up from church-yards and dissecting rooms, was endowed with life by galvanism. Assuredly, the main relations here involved, that of being put together and that of manifesting life, are familiar enough to everybody. Apply them to fragments of men—also familiar—and you get the monster".[2]

These three fundamental processes admit of sub-classification. For example, one may distinguish different kinds of relation (such as those of likeness, evidence, time, space and cause), different classes of fundaments, and so on. Further, in addition to the three qualitative processes there are three others of a quantitative kind; namely, "reproduction", "disparition" or

[1] *Idem; The Abilities of Man;* London, 1927.

[2] *Idem; Creative Mind;* (this Library); London, 1930.

disappearance and "clearness-variation". All six processes enter into intricate combinations with one another; and together, according to Spearman, they account for all human thinking whatsoever. The traditional 'faculties' he believes to be merely particular instances of the operation of these fundamental laws of cognitive activity. Even faculties, such as those of sensory perception and abstract thinking, between which the most profound gulf has been thought to lie, are concluded to be essentially akin.

Finally, when Spearman searched his newly mapped-out field of cognition for the presence of the general factor, he found that "it showed itself to be involved invariably and exclusively in all operations of eductive nature, whatever might be the class of relation or the sort of fundaments at issue".[1] And so, if we ask Spearman for a definition or description of intelligence, his reply is that we may attach what meaning we please to that objectionable term—objectionable because of what he considers to be its unfortunate associations with false psychological doctrines—but that, if we decide to use the word as a synonym for his general factor, we had better cease identifying intelligence with the power of abstract thinking, or learning, or adaptation, or self-criticism, or with any other particular capacity or faculty, and simply say that it is a factor which enters into all eduction of relations and correlates.

[1] *Idem; The Abilities of Man;* London, 1927.

CHAPTER III

TESTING SPECIAL ABILITIES

¶ 1. GROUP FACTORS. If it is true that nothing is achieved in the realm of mental activity without intelligence, it appears equally true that some achievements are not due to intelligence alone. The good engineer, for example, probably owes his success in some measure to a special mental aptitude. But there are many engineering processes, and if the special abilities which they require are entirely independent—or, in Spearman's language, 'specific'—these abilities are certainly too numerous to be measured by the psychologist engaged in vocational guidance. Only if there is a broad class of mechanical operations involving, in addition to the common factor of intelligence, a second common factor of mechanical ability, for which a single test can be applied, will the diagnosis of fitness for 'mechanical' work become practicable.

Spearman, although he holds that the factors other than intelligence which enter into mental activities are for the most part specific, admits that there is some evidence of the existence of 'group' factors, due to the 'overlapping' of the specific factors in operations which are of a closely similar character. It is these group factors that the vocational psychologist has in mind when he speaks of 'special abilities', but so far their nature and range have not been very fully investigated, and the testing of special abilities is still largely based on common sense assumptions.

¶ 2. PRACTICAL ABILITY. The plain man recognises the existence of group factors. He speaks, for example, of 'practical' ability, assuming that a person who shows himself adept at handling a concrete situation involving the arrangement of materials will prove equally competent or 'handy' in dealing with other situations of the same general class. And the plain man regards this ability as something quite different from intellectual capacity; indeed, he commonly pictures the highly intellectual person as being singularly 'unpractical'.

Psychologists have devised tests for the measurement of practical ability, regarding this ability as a variety or an aspect of intelligence. They have found that many a child who fails to shine in intelligence tests of the verbal sort is by no means a fool in matters of practical judgement; and they have hesitated to call such a child unintelligent. They have preferred to say that his intelligence is of a 'concrete' order, and that if it does not manifest itself in his performance of tests of the usual type, that is the fault of the tests rather than the fault of the child. The tests have an 'abstract' bias, and therefore they do not provide a true measurement of the intelligence of the 'practical' person. Thus Drever and Collins write:—"if by 'intelligence' we mean good sense or judgement as manifested in the various situations which life presents, then to test a child's intelligence by testing only his ability to deal with ideas and symbols is neither satisfactory nor adequate".[1]

[1] *Cf.* J. Drever and M. Collins; *Performance Tests of Intelligence;* Edinburgh, 1928.

To this argument other psychologists retort that the manipulation of ideas, rather than of things, is of the very essence of intelligent thinking. Terman, for example, ridicules the proposal, as he puts it, "that if the subject is not capable of the more complex and strictly human type of thinking, we should ignore this fact and estimate his intelligence entirely on the ability he displays to carry on mental operations of a more simple and primitive kind".[1]

Such discussions appear particularly futile to the followers of Spearman. Is it not time, they protest, that psychologists gave up their *a priori* assumptions as to the particular kinds of thinking which demand intelligence? By intelligence is meant the general ability which enters into all kinds of thinking, whether the material dealt with be abstract or concrete. It enters into the thinking of the barrister and into the thinking of the carpenter. But it does not necessarily follow that the good barrister and the good carpenter are equally intelligent, or that a concrete test measures intelligence just as effectively as does an abstract test. We include abstract problems, such as analogies, in our tests because they have been shown to be highly saturated with intelligence. If concrete problems are equally saturated with intelligence they will be equally good measures of intelligence. But if they are not so saturated—if the general factor is relatively unimportant, success depending to a considerable extent on the specific factors—then they are not good tests of intelligence; and the child who excels in

[1] *Cf.* L. M. Terman; *The Measurement of Intelligence;* London, 1919.

them, although he may, in the words of Drever and Collins, "manifest good sense or judgement" in some of "the various situations which life presents", is not for that reason to be described as highly intelligent.

Now, a recent study of certain tests of practical ability[1] led to the conclusion that these tests are not very effective measures of the intelligence of the adolescent boy, if by intelligence is meant the 'general factor' of Spearman. The saturation with intelligence is relatively low, specific factors playing an important part in determining success in the problems. For the practical purposes of vocational guidance, however, it matters little whether the child who fails in the abstract tests and succeeds in the concrete tests is described as an intelligent child whose intelligence is of the practical variety, or as an unintelligent child with a special practical ability. In either case the result will be the direction of the child to a practical occupation.

¶ 3. PERFORMANCE TESTS. Tests of practical ability are called 'performance' tests because they call for action rather than for mere thought, although successful action depends on effective thinking. These tests, which are mainly American in origin, are of various types. Gaw[2] has published a short account of their historical development and a full description of fourteen of the tests most

[1] *Cf.* F. M. Earle and M. Milner; *The Use of Performance Tests of Intelligence in Vocational Guidance;* H.M.S.O.; London, 1929.

[2] *Cf.* F. Gaw; *Performance Tests of Intelligence;* H.M.S.O., London, 1925.

commonly used; Earle and Milner[1] have carried out a statistical analysis of the results obtained, among elementary school children aged 14, with six of the tests in Gaw's series; McFarlane[2] has conducted a similar investigation, with a different group of tests, among pupils of technical and central schools; Drever and Collins[3] have described a short series (including some original items) which, although prepared primarily for deaf children, is suitable also for normal subjects; and an interesting single test, consisting of a graded series of nine problems, has recently been devised by Alexander.[4] The following are examples of the problems used:—

1. *Picture Completion.* The subject is shown a series of pictures, representing a day in the life of a school-boy. From each picture a small square portion has been removed, and the problem is to select, from a large number of small squares, all of the same size, those which will most suitably fill the gaps. It is the meaning, rather than the form, of the pictures that calls for study. For example, in one picture the boy is seated at breakfast while his mother is directing his attention to a point on the wall from which the square has been removed. A clock is required, and the subject must not only choose a clock (and not a picture or

[1] *Op. cit., supra.*

[2] *Cf.* M. McFarlane; "A Study of Practical Ability"; *Brit. J. of Psych. Monograph Supplement*, No. 8, 1925.

[3] *Op. cit., supra.*

[4] *Cf.* W. P. Alexander; "A New Performance Test of Intelligence"; *Brit. J. of Psych.*, XXIII, 1, 1932.

a window) but must also choose the particular clock which shows the most probable time for completion of breakfast and departure for school.

2. *Dominoes.* In this test the subject is required to match, from a set of dominoes placed in a row before him, a number of dominoes which have been exposed to his vision for a period of three seconds. The problems are presented in order of increasing difficulty, one domino being used in the first test and six in the last.

3. *Cube Construction.* Three wooden blocks are presented in turn, the problem in each case being to construct as quickly as possible, with a number of small cubes supplied, a block exactly resembling the model shown. In the first and second problems the cubes have a varying number of painted sides, and they must be put together so that the paint will appear only on certain surfaces of the completed model. In the third problem the partially painted cubes must be so arranged that the model will be entirely unpainted externally.

4. *Dearborn Formboard.* This is a comparatively difficult example of the common formboard test, in which the subject is required to fit wooden shapes into appropriate spaces. The material consists of a wooden board containing 21 removable insets of six different patterns, which may be inserted in varying combinations into 9 sunken spaces so as to fill these spaces completely. The subject is shown the board with certain of the pieces removed, the remaining material being so arranged that none of the omitted pieces will fit into any of the existing gaps. The task is to

re-arrange the material so that the board is completely filled, and this must be done as quickly as possible and in the minimum number of 'moves').

Two chief methods are used in calculating the total result of the tests. Sometimes the marks obtained in the several items of the series are added together to form the final score; sometimes the score obtained in each test is converted into a mental age, and the 'median' mental age (*i.e.*, the middle value) is taken as the measure of the total performance. The results of the investigation of Earle and Milner suggest a doubt as to whether either method is valid. For these authors discovered that the individual components of their series, unlike the components of the verbal tests, yielded a comparatively low correlation with one another. The large specific factors involved were to a great extent unrelated, and a child's mental age might be as high as 16 in one test and as low as 10 in another. If, then, the different tests are, to a large extent, measuring different abilities, what justification can there be for pooling the results in a single total?

Earle and Milner, however, found some evidence of a correlation, over and above the correlation due to the general factor, between tests, such as the Cube Construction test and the Dearborn Formboard, which involve *perception of relations of space;* and evidence in the same direction was discovered by McFarlane. In other words, these 'spatial' tests appeared to be related not only by the general factor, but also by a group factor. Moreover, these are the tests which appear to common sense to be the most closely related

to the practical operations of industry. Here, then, is a suggestion of a special practical ability which deserves the attention of the vocational adviser. The difficulty is to measure this special ability independently of intelligence, and the tests at present in use must be regarded as measuring a combination of the two factors.

The Cube Construction and Dearborn Formboard tests are among the most suitable for pupils of school-leaving age. Normally the present writer uses these tests only; and he has adopted the practice of making the assessment in part a qualitative one, based not merely on the numerical scores but also on observation of the way in which the scores have been obtained. This is a return to the 'impressionistic' method of common sense; but there can be little advantage in a quantitative assessment the exactness of which is more apparent than real; and the present limitations of performance tests are such that the mere score is often a far from true indication of the ability of the subject. These tests are much less perfect instruments than the verbal tests, the scores often being seriously affected by accidental circumstances and by temperamental conditions. But when the results are interpreted in the light of the examiner's careful observation of the subject's procedure, they provide indications which are of definite value.

Earle and Milner suggest that, when performance tests are applied to younger children, success may depend to a large extent on intelligence, the special abilities involved at the adolescent stage not yet having made their appearance. The same authors found that among adolescent girls

intelligence was a more important determinant of success in these tests than among adolescent boys.[1] This fact suggests the possibility that the special abilities exhibited by the boys may be acquired rather than innate; one can readily imagine how, in the 'spatial' tests at least, a sex difference might result from the boys' greater familiarity with toys of a constructional type.

Whatever may be the limitations of performance tests as measures of intelligence, there is no doubt as to their usefulness in providing a rough indication of the intelligence of certain abnormal persons—the deaf, the aphasic, the illiterate—for whom verbal tests, whether oral or written, are unsuitable. In America they have been found of value also in the testing of foreign subjects unacquainted with the English language. For the ordinary purposes of vocational guidance, however, it is perhaps best to use only a short selected series of the 'spatial' tests, and to regard these as a means of detecting a special 'practical' ability which appears to be of importance in work involving the organisation of concrete materials.

¶ 4. MECHANICAL ABILITY. The word 'mechanical', when used to describe work, is understood in at least three different senses. First, it may mean 'hand' work, as distinguished from 'brain' work; in this sense the trades of the bricklayer and the motor repairer are both mechanical. Secondly, it may mean work that is purely routine or 'automatic' as distinguished from work requiring planning

[1] *Cf.* also McFarlane; *op. cit.*

or judgement; in this sense the work of many clerks may be called mechanical. Thirdly, the term is used to denote a certain group of occupations which involve the understanding and manipulation of machines; in this sense the work of the motor repairer is mechanical, but not the work of the bricklayer or the clerk. It is this last meaning that the psychologist generally has in mind when he tries to assess 'mechanical ability'. He has assumed that there is a group factor entering into all kinds of work requiring an understanding of mechanisms, a special ability which makes for success in occupations differing in other respects as widely as do those of the watch-maker and the printing machine operative.

¶ 5. THE TESTS OF STENQUIST. The best known tests of mechanical ability are those devised in America by Stenquist.[1] Although his aim, like that of the authors of the performance tests, seems to have been to measure an alleged 'practical' or 'mechanical' intelligence conceived as the ability to manipulate 'things' rather than ideas, Stenquist's tests are mechanical in the more limited sense defined above. He first produced three 'assembling' tests, each of which consists of ten problems in putting together the parts of simple mechanisms such as a lock and a bicycle bell. The material is presented in a box containing ten compartments, in which are placed the disassembled parts of the ten objects. The subject is required to assemble as

[1] *Cf.* J. L. Stenquist; *Measurements of Mechanical Ability;* New York, 1923.

many as possible of the mechanisms in the thirty minutes allowed, attempting the problems in order of increasing difficulty. The scoring is objective, marks being awarded for each model on a scale of 1 to 10 according to the degree of success achieved. The test may be used as a group test, screens being placed between the subjects to prevent 'copying'. Paper tests, more convenient for application to a group, have been produced also by Stenquist. These are pictorial in form and call for recognition of, and reasoning about, mechanical relationships. All the tests were found by their author to yield low correlations with verbal tests of intelligence but fairly high correlations with estimates of proficiency in mechanical work. Stenquist therefore concluded that they were valuable instruments for detecting an aptitude of considerable vocational importance which the intelligence tests fail to reveal.

A modified form of the Stenquist assembling test has been used in Britain, and the scores obtained by different groups of subjects, together with the scores of the same subjects in various other tests, have been analysed by means of the statistical technique of Spearman.[1] It was found that, when allowance was made for correlation due to the general factor, there remained a further small correlation between the assembling test and certain performance tests of the 'spatial' order. This suggests that success in the assembling test may depend in part on the group factor of spatial perception to which reference has been made in

[1] *Cf.* F. M. Earle and A. Macrae; *Tests of Mechanical Ability;* Nat. Inst. of Ind. Psych.; London, 1929.

the discussion of performance tests. But the connection of the performance tests with the assembling test is by no means a close one. The latter differs from the former in that its correlation with verbal tests of intelligence is extremely low. It also seems to include a factor which does not enter into the performance tests; for the subject must not only grasp relationships of form in order to see how the parts of the mechanism may be fitted together, but must also perceive how the mechanism as a whole *functions*. There are various ways in which the parts of a bicycle hub may be put together, but there is only one mechanically best way, and this must be discovered if the problem is to be solved correctly.

The results obtained in Britain by correlating scores in the assembling test with instructors' estimates of proficiency in skilled mechanical trades are not so satisfactory as those reported by Stenquist, but they cannot be regarded as conclusive, for the investigations have been of a very ited kind. In the study which has been referred to above he correlations were found to vary considerably in value, few being high. In a more recent experiment in Birmingham[1] the degree of correspondence between test results and estimates of 'apprentice ability' proved disappointingly small. It must be remembered, however, that success in a skilled trade depends on a number of factors, both of ability and of character, and that some of these factors the assembling test does not pretend to measure. Even if the

[1] *Cf.* E. P. Allen and P. Smith; *Selection of Skilled Apprentices for the Engineering Trades;* Education Committee; Birmingham, 1931.

test is not very reliable when used as the sole criterion of fitness for engineering and kindred occupations, it may still be of considerable use when the results are considered in conjunction with other appropriate measures or estimates.

The feature of the assembling test which is most commonly criticised is the familiarity of the test material. The critics assert that, since the subjects vary considerably as regards their previous acquaintance with the mechanisms, individual differences in ability cannot be measured reliably by a test of this kind. To this it may be replied that differences in familiarity with the material are probably indicative of differences in mechanical aptitude, and that the boy who, having previously handled a great part of the material, obtains a high score is a boy who would probably have obtained a high score in any case. But it must be admitted that the weakness referred to is a real and a serious one, and that as an instrument of measurement the assembling test is rough and ready in the extreme. The present writer has arrived at the conclusion that it is an instrument which must be used with considerable caution, and that it is never safe to predict suitability for skilled mechanical work as a result of a good performance in this test alone. Nevertheless, many cases could be quoted in which boys who have succeeded in the test have been persuaded to adopt mechanical callings and have found no reason to regret their choice.

Case 5.—A boy, who was one of a group examined in a reformatory institution, was found to have low intelligence and a very unstable character. He had caused some trouble

by failing to persevere in any work that had been allocated to him, and he certainly did not seem to be a boy for whom any sort of vocational success could confidently be predicted. In the assembling test, however, he obtained a good score, this being his one successful performance in the vocational examination. Accordingly the examiner suggested that he might be given a trial at the less skilled work of the plumbing squad. The boy objected strongly to this proposal; the weather at the time was cold and wet, and his ambition was to obtain employment in the cookhouse. But his objections were overruled and a plumber he became. Some years later, when reports of progress were obtained, this boy was given the best report of all. He remained a contented plumber throughout the whole period of his sojourn in the institution, and he gave great satisfaction in that work.

¶ 6. THE RESEARCHES OF COX. By far the most thorough theoretical investigation of mechanical ability is that conducted by Cox.[1] Unlike Stenquist, Cox did not assume the existence of a group factor of mechanical ability and then proceed to devise tests for the measurement of that factor. His tests were constructed for the purpose of discovering whether there is any such thing as mechanical ability. These tests are of four kinds, named respectively Mechanical Completion, Mechanical Diagrams, Mechanical Explanation and Mechanical Models, of which the last named series is perhaps the most interesting. The mechanical models are

[1] *Cf.* J. W. Cox; *Mechanical Aptitude;* London, 1928.

wooden mechanisms which the examiner works by hand in the presence of the subjects, who see certain movements occurring and are required to judge how these movements are produced. For example, one of the simpler models, as seen by the subjects, consists of a small rectangular board in which two vertical slots have been cut. Through each slot there projects a circular wooden 'button', and projecting beyond one of the vertical margins of the board is a wooden 'handle'. The board is painted black and the buttons and handle are white. The examiner holds up the board in the perpendicular position and proceeds to move the handle upwards and downwards alternately. When the handle is in the full 'up' position, the one button appears at the top of its slot, the other at the foot. As the handle is moved downwards, the buttons travel downwards and upwards respectively until their positions in the slots are completely reversed. As the handle returns to the 'up' position, the buttons again change places in their slots. The problem is to picture the connections at the back of the board which cause these things to happen. The subject is provided with an outline diagram of the model and is required to show by a simple sketch his conception of the way in which the observed movements are brought about.

Cox applied his four series of tests to various groups of subjects, including boys apprenticed to various mechanical trades in the Royal Air Force. He also obtained estimates of trade proficiency and results of examinations in technical subjects. Then, applying Spearman's mathematical methods to the data, he found conclusive evidence

of a group factor entering into the various tests and the various trades. He also found that the group factor in the tests was of very considerable magnitude, although the general factor also played a not unimportant part; and he concluded that, by combining the best of the tests, he could obtain a test 'team' or 'battery' which would measure this group factor of mechanical aptitude with a very satisfactory degree of accuracy.

The Cox tests, as has been said, were devised for the purpose of investigating the existence of mechanical ability, and they have not yet been widely used for the measurement of that ability. They were employed in the Birmingham experiment referred to above, and the results obtained with them were highly satisfactory. The Mechanical Models and the Mechanical Diagrams proved particularly promising. The Models test in its original form is difficult to score; but the author has recently devised a new form of this test in which the response required is of the 'selective', as distinguished from the 'inventive', order, the scoring being simple and completely objective. A further difficulty is that the complete Models test occupies more time than can usually be afforded for any single test in the vocational examination, but it is hoped that a shorter series may prove a sufficiently effective measure. It may be that the Cox tests are somewhat too difficult for the elementary schoolboy of 14; but with older boys they will doubtless prove to be more exact and reliable instruments than the assembling tests of Stenquist.

In tests of mechanical ability boys prove more successful

than girls, but the explanation of their superiority is difficult to determine. Burt has expressed the view that the sex difference is probably, in part at least, innate and that it is probably not so much a difference in capacity as a difference in interest, dependent on temperamental rather than on intellectual factors.[1]

¶ 7. FORM PERCEPTION. Whatever may be their differences, the mechanical tests and many of the performance tests are alike in that they demand visual analysis of form. Attempts have been made to measure this factor of form perception by means of paper-and-pencil tests in which the subject is required neither to manipulate actual materials nor to perceive relationships of a specifically mechanical kind. For example, there is a test[2] in which drawings of incomplete geometrical figures (chiefly squares and rectangles) are shown, the problem being to select, from a number of smaller figures, those which would exactly fill the 'gaps'. In some cases a considerable amount of mental manipulation of the small pieces is required before these can be imagined fitting into the appropriate spaces. In two of the eight sections of the test the larger figures represent cubes, the task demanding accurate visualisation of the three-dimensional solids from observation of the two-dimensional drawings.

The factors entering into the 'form relations' test have

[1] *Cf.* C. Burt; *The Measurement of Mental Capacities;* (Henderson Trust Lecture, No. VII); Edinburgh, 1927.

[2] Form Relations Group Test; Nat. Inst. of Ind. Psych.

not yet been thoroughly investigated. The correlations obtained with estimates of success in a limited number of constructional and mechanical trades are uniformly positive although not very high; but the extent to which these correlations are due to the general factor rather than to any group factor has not been exactly determined. The use of this test, as of many others, is based largely on common sense assumptions and not on scientifically established knowledge. It is assumed that success in the test indicates the presence of a special ability which is desirable in many occupations involving spatial perception; occupations, for example, such as those of the architect, the surveyor, the engineer, the surgeon, the carpenter, the dressmaker, and the packer. It is an assumption for which there is at present only a certain empirical justification.

Case 6.—A boy who had followed an engineering course at a technical college was forced to abandon his studies because he found himself incapable of mastering mechanical drawing. His intelligence was found to be very high, and he had achieved distinction in pure mathematics. In the form relations test, however, his work was poor. Had he sought vocational advice before entering college, he would certainly have been warned that engineering was a distinctly questionable choice.

¶ 8. MANUAL DEXTERITY. By manual dexterity is meant that ability to make precise and speedy movements of the hands which seems to be an important component of many professional and industrial skills. It is a physiological

rather than a psychological capacity, although even here the ubiquitous general factor is found in some small degree. Common sense suggests that there is a group factor of dexterity; that people who are neat-fingered in one particular kind of manual work tend to be neat-fingered in general. So far, however, the verdict of common sense has not been confirmed by the results of scientific inquiry. Earle and Gaw,[1] in a study of a series of dexterity tests used in an experiment among school children in London, found that the inter-correlations of the tests were low, the factors principally determining success in each test being specific to the test situation. This conclusion is in harmony with those of many other investigators. Long and Pear[2] have summed the matter up thus:—"To the question 'Can we devise vocational tests to cover the many types of industrial work mainly involving motor activities?' the reply must be that experience has shown that this implies the devising of a special test for every single kind of such industrial work. A test that will reveal the capacity required for one activity will not detect the capacity required for another". Here, then, is a regrettable gap in the equipment of the vocational adviser; but it may be that the negative results hitherto obtained have been due in some measure to imperfections in the tests, which are mainly of a simple repetitive type, or in the method of their

[1] *Cf.* F. M. Earle and F. Gaw; *The Measurement of Manual Dexterities;* Nat. Inst. of Ind. Psych.; London, 1930.

[2] *Cf.* A. E. W. Long and T. H. Pear; *A Classification of Vocational Tests of Dexterity;* H.M.S.O., London, 1932.

administration. The matter is one which urgently demands further research.

¶ 9. VERBAL ABILITY. Intelligence tests have been criticised not only because of their 'abstract' nature but also because of their 'verbal' nature. It has been thought that there is a special verbal or 'linguistic' ability which contributes to success in all mental activities which involve the comprehension or the use of language. The existence of a broad group factor of this description has not, however, been clearly established. Spearman,[1] summing up such evidence as is available, concludes that there is no group factor of any magnitude entering into all verbal performances, no special ability for work which involves thinking in terms of words.

But there can be little doubt as to the existence of a special verbal ability in the more limited sense of fluency of verbal expression. There are persons who lack this facility despite the fact that they obtain very high scores in verbal intelligence tests; and there are dull persons with so impressive a gift of language that their defects of general capacity may not be very evident until the tests are applied. Children of the latter type may be rated too highly when examined by the Binet tests, some of which call for verbal glibness rather than for intelligence; but whether their limited gift is of any considerable assistance to them in a good group test is very questionable.

Fluency of expression in writing may be an important vocational asset. Probably it can be assessed most reliably

[1] *Cf.* C. Spearman; *The Abilities of Man;* London, 1927.

in the school, but the vocational adviser who is not closely in touch with the schoolmaster finds it useful to apply a test for it in the form of an exercise of the essay type. In one such test the subject is shown two brief 'summaries' which he is required to expand. The result, which reflects not only natural facility but also the effects of training, cannot be assessed in a quantitative way, but it often provides indications which are of distinct value in vocational guidance.[1]

¶ 10. ARITHMETICAL ABILITY. A special ability has been shown to underlie proficiency in arithmetical computation,[2] and it may be tested by means of standardised arithmetical exercises such as those devised by Burt.[3] Spearman concludes that this factor extends to the higher levels of arithmetical work, while Burt suggests that success in 'problem' sums depends on high intelligence rather than on any specialised capacity.

¶ 11. OTHER ABILITIES. The subject of *musical ability* has been studied intensively by Seashore,[4] who has devised tests, in the form of gramophone records, for the measurement of certain factors in musical capacity, such as sense of pitch, of time and of consonance. These tests, being of a

[1] *Cf. infra*, p. 97.

[2] *Cf.* C. Burt; *The Distribution and Relations of Educational Abilities;* St. Albans, 1917.

[3] *Idem; Mental and Scholastic Tests;* London, 1921.

[4] *Cf.* C. E. Seashore; *The Psychology of Musical Talent;* Boston, 1919.

very specialised kind, are not commonly included in the vocational guidance examination.

Very little work has been done in the testing of *creative ability* or, as it is sometimes called, *constructive imagination.* Is there a group factor of inventiveness, or are there various specific, unrelated kinds of inventiveness? These are questions to which no certain answers can be given. Spearman[1] has argued that, since inventive thinking can be shown to involve the same laws of cognition (more especially the eduction of correlates) as are involved in other kinds of intelligent thinking, therefore it is unnecessary to assume that there is any special faculty or capacity of inventiveness at all.[2] *Artistic appreciation*, like artistic creation, is a relatively unexplored field.

There appear to be group factors of *memory*, but the different forms of remembering are not so highly correlated that a single test can be used to measure efficiency of memory in general; nor do the results of experiments with tests of *attention* suggest that such tests would be of any particular value in vocational guidance.

Doubtless the reader will have found the above list of 'special abilities' surprisingly short. He will have observed that no reference has been made to many of the special talents recognised by the composers of testimonials and obituary notices. "What of the logical ability of the great barrister", he may ask, "or the organising ability of the

[1] *Cf.* C. Spearman; *Creative Mind;* (this Library); London, 1930.

[2] *Cf.* also H. L. Hargreaves; "The 'Faculty' of Imagination", *Brit. J. of Psych. Monograph Supplement*, No. 10, 1927.

great business administrator?" The answer is that logical ability seems to be very much the same thing as intelligence, and that probably organising ability is intelligence combined with a special temperament rather than with a special capacity. Group factors of any magnitude appear to be relatively few, and, being bound up with the general factor, they are not easily isolated for purposes of measurement. Tests of special abilities are at present tentative and inexact; yet they are by no means worthless. They provide useful indications of ability, and they also afford the examiner a valuable opportunity of observing temperament; but that is a subject to which a separate chapter must be devoted.

CHAPTER IV

ESTIMATING TEMPERAMENT AND CHARACTER

¶ 1. UNSATISFACTORY STATE OF PRESENT KNOWLEDGE. Even if mental abilities could be measured by means of tests infinitely more exact than those at present in use, such tests alone would not make possible reliable prediction of an individual's vocational bent. Human behaviour depends to a great extent on factors which are by no means of the purely intellectual or cognitive order, and these factors play a very important part in determining occupational happiness and success. "In the right environment an ounce of 'pushfulness' may be more effective than a ton of learning, and tact will often go higher up the ladder than cleverness".[1]

The psychology of temperament and character is still in a somewhat backward state. There is no generally accepted body of theory, and the literature of the subject contains much confusion of terminology. The word 'temperament' (or 'disposition') is commonly used to denote what is inborn, and 'character' what is acquired; but the acquired is built up on a foundation of the innate, and it is difficult to discover how much is due to nature and how much to nurture.

[1] *Cf.* F. C. Bartlett; "Temperament and Social Status"; *Journ. Nat. Inst. Ind. Psych.;* III, 8, 1927.

¶ 2. PHYSIOLOGICAL THEORIES. The ancients distinguished four temperaments—the sanguine, the choleric, the phlegmatic and the melancholic—which they supposed to be determined by varying admixtures of the fluids or 'humours' of the body; and at the present day there are those who offer a physiological explanation of temperamental differences, substituting for the classical humours the secretions of certain bodily structures known as the 'endocrine glands'.[1] These glands, which apparently act in association with one another and with the nervous system, are credited with the power of influencing not only a person's bodily growth but also his temperamental condition. Persons with a deficient thyroid secretion, for example, tend to be sluggish in their emotional reactions, while those in whom this gland is over-active are excitable and irritable. But the science of endocrinology is not in a very advanced state; and the day is not yet at hand when character will be explained in terms of chemistry, and defects of character remedied by injection of appropriate glandular extracts.

¶ 3. THE MORPHOLOGICAL APPROACH. Students of morphology, or bodily configuration, have discovered correspondences between particular physical and temperamental constitutions. Thus Kretschmer[2] distinguishes two main types of physique which he calls the 'pyknic' (short

[1] *Cf.* L. Berman; *The Glands Regulating Personality;* New York, 1921.

[2] *Cf.* E. Kretschmer; *Physique and Character;* London, 1925.

and thick) and the 'asthenic' (long and lean), and which he has found to be associated, respectively, with temperamental tendencies designated 'cycloid' and 'schizoid'. The psychological characteristics of the two types have been picturesquely described by E. Miller.[1] The pyknic-cycloids "are not animated by the call of the eternal verities. To them the spirit of the age is more real than the spirit of the ages; they occupy themselves with social schemes, not because they are schemes but because they are social. Fussy busybodies are found amongst them, but rarely cold calculators. Such men laugh heartily and eat with relish. They are epicureans without fastidiousness, humorists but rarely wits". The asthenic-schizoids are more reserved and lonely souls, relatively devoid of emotional responsiveness to their environment. "These are the eminent Georgians, who foregather in Bloomsbury's green and pleasant squares. They are singularly feminine in physique and voice. The beard frequently adopted is fine and ætiolated as plants grown in sunless cupboards. Their views are precious and *raffiné*. Every idea is carefully chosen so as to be devoid of any suggestion of vulgarity. They despise the Victorianism of their fathers, and replace the spinsterism of those days by a variety of their own".

This distinction is not unlike one that has been recognised all down the ages—the distinction between the man of reflection and the man of action, the dreamer and the doer, or, in more modern parlance, the 'introvert' and the 'extravert'. But the student of individual differences finds

[1] *Cf.* E. Miller; *Types of Mind and Body;* London, 1926.

such clean-cut dichotomies of little practical utility. Human beings in their immense variety can no more easily be classified into pyknics and asthenics, or introverts and extraverts, than into geniuses and idiots. "There are, in fact, no such things as mental types; there are only mental tendencies".[1]

¶ 4. THE THEORY OF INSTINCTS. The most illuminating of recent contributions to the study of temperament and character have come from two very different sources. On the one hand, a group of academic psychologists, studying the behaviour of man in the light of modern biological discoveries, has emphasised the importance in human life of the primitive instinctive tendencies which were formerly supposed to be the exclusive possession of the brute creation. On the other hand, certain psychiatrists, or medical psychologists, as a result of their observation of abnormal conditions, have propounded theories of mental functioning which have been of not a little service in promoting a better understanding of the normal man.

A thorough-going instinctive theory of human behaviour was first put forward by McDougall in a book that has become a psychological classic.[2] An instinct, as defined by this author, is an inborn disposition which "determines its possessor to perceive, and to pay attention to, objects of a

[1] *Cf.* C. Burt; *The Measurement of Mental Capacities;* Edinburgh, 1927.

[2] *Cf.* W. McDougall; *An Introduction to Social Psychology;* London, 1908.

certain class, to experience an emotional excitement of a particular quality upon perceiving such an object, and to act in regard to it in a particular manner, or, at least, to experience an impulse to such action". For example, the operation of the instinct of escape involves an awareness of the proximity of a natural enemy, an experiencing of the emotion of fear, and an impulse to the activity of flight. McDougall's most recently published list[1] of human instincts contains fourteen names, including the instinct of combat (with the emotion of anger), the instinct of repulsion (with the emotion of disgust), the parental instinct (with the emotion of tenderness), the social or gregarious instinct, the sex instinct, instincts of self-assertion, submission, acquisition, etc. Other leading psychologists publish slightly different lists and disagree with McDougall on various points of theoretical interpretation.[2]

The human instincts are a legacy from man's remote animal ancestors. They were evolved to serve biologically useful ends—the self-preservation of the individual and the survival of the species. And although in civilised societies they may be called into play by situations, and may issue in activities, very different from those of the jungle, they remain, however disguised, the prime movers of all human behaviour.

The various instincts are inherited in various degrees of strength by different individuals, and the sum of a man's

[1] *Idem; An Outline of Psychology;* London, 1923.

[2] *Cf.* J. Drever; *Instinct in Man;* Cambridge, 1917; and A. C. Garnett; *The Mind in Action;* (this Library); London, 1931.

instinctive tendencies constitutes what McDougall calls his 'disposition', but what is usually described as his 'temperament'. Some temperaments are characterised by excessive strength of one particular tendency. Thus a man with a powerful instinct of combat has a pugnacious or irascible temperament. Another may have a timid, amorous, gluttonous, vain, humble, sociable, fastidious, or miserly temperament. The man of 'well-balanced' temperament is he in whom all the instincts are of moderate potency.

G. 5. GENERAL EMOTIONALITY. Burt[1] claims to have found statistical evidence of a general factor of emotionality underlying the various specific emotions, just as the general factor of intelligence underlies all intellectual processes. He has observed, particularly among delinquent children, that excessive strength of one particular instinct tends to be accompanied by a more or less excessive strength of the remainder. And he seems to regard a high general emotionality, at least during the years of childhood, as necessarily involving emotional 'instability'. "First one impulse, then another, then a third, each contradictory to the last, and each successively excited by the changing situations of the moment, explodes forthwith into action. And the life of the unstable child becomes a series of discontinuous fulminations, like the pops of a Chinese cracker". Aveling,[2] on the other hand, regards it as

[1] *Cf.* C. Burt; *The Young Delinquent;* London, 1925.

[2] *Cf.* F. Aveling; *Personality and Will;* (this Library); London, 1931.

questionable whether differences in stability may not be due merely to differences in the acquired control of the instinctive impulses by the will—a control which has been found by Webb[1] to be a general factor, causing a correlation between positive qualities of character. But such control is relatively difficult to achieve when the instincts are naturally strong, and it seems probable that the degree of a person's stability depends on both innate and acquired tendencies.

¶ 6. THE DEVELOPMENT OF CHARACTER. According to McDougall, the instinctive tendencies, although they may be modified in strength as a result of use or disuse, are not radically changed. A man's temperament is born with him and he can do but little to alter it. But he can do much to control it; and control is rendered possible by the organisation of the native tendencies in complex acquired dispositions which are called 'sentiments' and together constitute 'character'.

A sentiment[2] is defined as "an organised system of emotional tendencies centred about some object". The typical sentiments are love and hate, which are not merely emotions but "enduring tendencies to experience certain emotions whenever the loved or hated object comes to mind. . . . When a man has acquired the sentiment of love for a person or other object, he is apt to experience

[1] *Cf.* E. Webb; "Character and Intelligence", *Brit. J. of Psych. Monograph Supplement*, No. 3, 1915.

[2] *Cf.* A. F. Shand; *Foundations of Character;* London, 1914.

tender emotion in its presence, fear or anxiety when it is in danger, anger when it is threatened, sorrow when it is lost, joy when the object prospers or is restored to him, gratitude towards him who does good to it, and so on; and, when he hates a person, he experiences fear or anger or both on his approach, joy when that other is injured, anger when he receives favours".[1]

The child in the course of his development acquires sentiments of liking and disliking not only for particular persons and things, but also for moral qualities such as honesty and justice; and it is these moral sentiments that constitute the most important elements of character. The final development of character is the organisation of the moral sentiments under a regulating or 'master' sentiment, the sentiment of self-respect. It is the dominance of this sentiment which gives a man "strength of will" and enables him to act consistently in accordance with his ideal. Self-respect is "the fly-wheel of character, the regulator of conduct, the supreme arbiter in all moral deliberation; its desire to be and do the right thing becomes the decisive factor in all moral choice and true volition".[2]

But the power of the most exalted sentiments to determine conduct is derived from the energy of the primitive instinctive impulses which enter into their constitution. The greatest achievements of human altruism, for instance,

[1] *Cf.* W. McDougall; *An Introduction to Social Psychology*, 14th ed.; London, 1919.

[2] *Idem; Character and the Conduct of Life;* London, 1927.

are fundamentally due to the promptings of the parental instinct. "The instinctive impulses determine the ends of all activities and supply the driving power by which all mental activities are sustained; and all the complex intellectual apparatus of the most highly developed mind is but a means towards these ends, is but the instrument by which these impulses seek their satisfactions. . . . Take away these instinctive dispositions with their powerful impulses, and the organism would become incapable of activity of any kind; it would be inert and motionless like a wonderful clock whose mainspring had been removed or a steam-engine whose fires had been drawn".[1]

McDougall's theory may be too simple an explanation of human character and conduct, but his dynamic conception of a human being as a creature that is continually impelled by strong inner forces to pursue particular ends is an important advance on the predominantly intellectualistic outlook of the old psychologists, who studied man as a knower rather than as a doer. "On the old view the chief psychological problem of human behaviour came to be to explain how it was possible for men sometimes to act unreasonably. The true psychological problem is to explain how they ever come to act reasonably".[2]

¶ 7. THE PSYCHOANALYTIC THEORY. The 'new psychology' which has recently been built up by psychiatrists of the

[1] *Cf.* W. McDougall; *An Introduction to Social Psychology*, 14th ed.; London, 1919.

[2] *Cf.* J. Drever; *The Psychology of Everyday Life;* London, 1921.

'psychoanalytic' school is also a dynamic one. It regards man as a being who is continually striving to satisfy strong elemental impulses; but it emphasises the importance, as determinants of human behaviour, of sentiments or 'complexes' of which the individual is wholly unaware. According to the psychoanalysts, the symptoms of the mentally diseased are due to the striving of desires which have been denied their natural expression and have been banished or 'repressed' into the 'unconscious' part of the mind, where they do not lie dormant, but continue to seek satisfaction. To effect a cure it is necessary to discover these submerged desires and to resolve the unconscious conflict by liberating the imprisoned impulses and re-directing them into legitimate channels. The patient, under the guidance of the physician, surveys his past life, working backwards to the origin of the trouble; and this is commonly found to lie in infantile desires which social restraints imposed in the earliest years of life have caused to be 'bottled up' unsatisfied, and which, until the process of analysis brings them to light, are beyond the reach of the patient's memory. And of the unsatisfied urges which give rise to mental illness, by far the most important are considered—at least by the numerous followers of Freud, the brilliant pioneer of the psychoanalytic movement—to be those connected with the sexual impulse.[1]

Psychoanalysis is anathema to most members of the medical profession, and the intelligent lay person who is

[1] Perhaps the best introduction to psychoanalytic theory is Freud's own *Introductory Lectures on Psychoanalysis;* London, 1922.

not possessed of an excessive credulity is apt to consider some of the Freudian interpretations ridiculously far-fetched, and often dismisses the whole psychoanalytic doctrine as a tissue of absurd falsehoods. But psychologists and psychiatrists, even although many of them reject much of that doctrine, commonly admit that some at least of the fundamental conceptions of the psychoanalytic school are of great service not only in the study of mental disease, but also in the understanding of the behaviour of more or less normal persons; for many of the symptoms of the mentally ill are merely exaggerated forms of phenomena frequently observed in everyday life.[1]

¶ 8. REPRESSION, COMPENSATION AND SUBLIMATION. Conflicts between two instinctive impulses, or between an instinct and a sentiment, or between two sentiments, are exceedingly common. The boy, for example, who has frequently been the victim of paternal discipline may acquire an attitude of hostility and revolt which, being incompatible with his sentiment of filial affection, is repressed into the unconscious. Outwardly the boy remains deferential, but the repressed 'complex' may influence his behaviour in various ways. It may manifest itself in a strong dislike of the father's occupation, although this seems admirably suited to the boy's capacities. And in such a case the boy, unaware of the real cause of the aversion, may offer many plausible arguments against the choice of his father's career, his reasoning being an elaborate

[1] *Cf.* B. Hart; *The Psychology of Insanity;* Cambridge, 1912.

process of self-deception or, as it is technically termed, 'rationalisation'.

Complexes of 'inferiority' are common among adolescent boys and girls who possess some physical or mental defect; and in such cases 'defence mechanisms' of various kinds may be established. The unintelligent boy may fight shy of study, explaining his educational backwardness as due to lack of effort, and so avoiding the necessity of confessing to himself his lack of capacity; or he may throw himself with tremendous zest into the pursuit of a mechanical hobby, finding in practical achievement 'compensation' for his academic weakness. Often the inferiority complex results in the outward assumption, in an exaggerated form, of the very quality in which the individual is most deficient, as when the shy, diffident child adopts, as a protective mask, a blustering, over-confident, aggressive bearing. Sometimes the complex expresses itself not in action, but in excessive day-dreaming or 'phantasy', the child seeking an imaginary fulfilment of desires which cannot be gratified in the world of reality. The vocational ambitions of less gifted children often appear to be compensatory phantasies of this kind.

When two impulses conflict with each other, the result is not necessarily repression. One of the opposing impulses may obtain indirect expression and so find a substitute satisfaction. The girl with a strong maternal instinct may find an outlet for her protective tendencies in some form of philanthropic work; and the redirected energy of the sex instinct is supposed to subserve much creative activity in

literature and the arts. This process is termed 'sublimation', and it is one which may be greatly assisted by an appropriate choice of work.

¶ 9. THE EMPIRICAL STANDPOINT. Clearly, then, the vocational adviser, even if he regards psychoanalysis as a cult rather than a science, cannot fail to profit by a knowledge of the genuine contributions of the psychoanalytic school to psychological theory. But, in truth, the more he studies the writings of all the schools, the more does his conviction grow that the theory of temperament and character, both normal and abnormal, is in a state of considerable confusion and that a true science of these matters is a thing of the future. For that reason, there are some who would confine the vocational examination to tests of abilities and would leave the elusive factors of temperament altogether out of account. Yet to adopt such a course would be a very great mistake. For much occupational unhappiness is due to temperamental conditions which, if they cannot be explained, can certainly be observed in the adolescent boy and girl; and the practical psychologist consoles himself with the reflection that his estimates of these conditions are certainly no less 'scientific' than are many of the clinical estimates of the physician. His standpoint has been well expressed by Bartlett[1]:—"What, then, do we mean by temperamental factors, and how can they be discovered? Everybody asks these questions now and nobody is satisfied with the answers. So far as I can see . . .

[1] *Loc. cit., supra.*

no definition in general terms is the least use. All we can do is to point to certain characteristics and say we mean such as these: timidity, daring, recklessness, vanity, boastfulness, caution, pushfulness, contentedness, a certain permeability to beauty, and so on . . . they are qualities which are usable and identifiable; they indisputably help to determine social status and they do give us an entry to our problem. It is no use being hypercritical at this stage. We have to take such a list—nobody need suppose it to be final—and see what can be done with it".

¶ 10. TESTS OF TEMPERAMENT. Various attempts have been made, mainly in America, to measure temperamental and moral traits by means of standardised tests. Perhaps the most widely used of such tests are those devised by Downey,[1] which include a number of exercises in handwriting. The subject is required to write at his ordinary speed, then as quickly as he can, then as slowly as he can, then to change the style of his writing as much as possible, and so on. The tests are alleged to indicate such characteristics as carefulness, decisiveness and persistence; but the results obtained with them by various investigators, both in America and in Britain, have been somewhat disappointing. The reader will find a critical account of these and other temperamental tests in Burt's *The Young Delinquent*.

[1] *Cf.* J. E. Downey; *The Will-Temperament and its Testing;* London, 1924.

¶ 11. PERSEVERATION. Quite recently Pinard[1] has obtained promising results in an investigation of the value of 'perseveration' tests as aids to the diagnosis of temperamental conditions. Perseveration is the name given to the spontaneous revival of recent mental impressions, such as occurs when a tune lingers in the memory after the music has ceased, or when the rolling of a ship continues to be felt by a person who has disembarked. It has been found that different individuals vary greatly in the degree to which they are subject to this mental 'lag'; and many ingenious tests have been devised for its detection and measurement. Pinard classified his subjects (inmates of a children's home at Leytonstone and patients at the Maudsley Hospital) into four categories:—extreme perseverators (E.P.), moderate perseverators (M.P.), moderate non-perseverators (M.N.), and extreme non-perseverators (E.N.). And when he compared the test results with estimates of character qualities, he discovered some striking correspondences. He found, for example, that perseverance and self-control tended to be associated with moderate degrees of perseveration, while the majority of the 'difficult' and unreliable subjects were persons in whom the perseverating tendency was either extremely strong or extremely weak. "It is a remarkable fact", he writes, "that of the twenty-four prefects in the six houses of the Leytonstone Home, seventeen belonged to the M.N. group, five to the M.P. group, and two to the E.P. group. Of these

[1] *Cf.* J. W. Pinard; "Tests of Perseveration"; *Brit. J. of Psych.*; XXIII, 1 and 2; 1932.

the five in the M.P. group were considered more reliable and better leaders from the staff's point of view than the other groups. The two prefects in the E.P. group were in constant conflict with the staff". At present these tests are by no means exact diagnostic instruments; but when used with due caution as a supplementary aid to the temperamental examination they may be of considerable assistance.

¶ 12. THE QUESTIONNAIRE METHOD. Other investigators have attacked the problem of temperamental diagnosis by the method of the questionnaire, the subject being asked to indicate his habitual modes of behaviour in particular circumstances. For example, there is a well-known American questionnaire[1] designed to provide a measure of a person's tendency to 'ascendant' or 'submissive' behaviour; social situations are described together with a number of possible responses of a dominating and yielding character, and the subject is instructed "spontaneously and truthfully" to mark in each case the particular response which most nearly represents his usual reaction. Whatever may be thought of the American habit of 'scoring' such questionnaires in order to obtain a numerical assessment of the qualities or tendencies investigated, there is no doubt that the answers to the questions, if candidly given, may be most illuminating.

¶ 13. THE TRADITIONAL INTERVIEW. But no plan yet devised for the estimation of temperamental tendencies can

[1] *Cf.* G. W. and F. H. Allport; *A–S Reaction Study;* Boston, 1928.

compete with the personal interview, conducted by an expert psychologist in a systematic way. The interview is the time-honoured method of 'sizing-up' a person's characteristics, but as ordinarily used it is notoriously unreliable. A man placed in charge of the 'hiring-on' window of an American industrial firm is reported to have described his methods somewhat as follows:—"On Mondays I turns down all the men with white collars, on Tuesdays all with blue eyes, Wednesday all with dark eyes. Red-headed men I never hires, and there do be days when I has a grouch and hires every tenth man".[1] This, of course, is a somewhat exaggerated account of the employment manager's usual procedure, but recent experiments have shown that procedure to be extremely untrustworthy. Hollingworth,[2] for example, reports an interesting investigation in which 57 applicants for positions in salesmanship were interviewed individually, and placed in order of merit, by 12 different sales managers, all experienced in 'personnel selection'; and he sums up the results as follows:—"Almost any given applicant is likely to receive ratings placing him at any point in the scale, from first position to last. Applicant C, for example, is given position 1 by one judge, 57 by another, 2 by a third, and 53 by a fourth judge; in general, he occupies positions all along the scale of 'suitability'. Much the same result is to be observed with all the applicants. . . . However much

[1] *Cf.* H. C. Link; *Employment Psychology;* New York, 1919.

[2] *Cf.* H. L. Hollingworth; *Vocational Psychology and Character Analysis;* New York, 1929.

the personal interview may be improved by better methods of inquiry and report, in its traditional form it is highly unreliable. No better evidence is required than the spectacle of two different expert interviewers, one rejecting an applicant as the most unsuitable of the group of fifty-seven, another selecting him as the choice specimen of the lot". Similar results were obtained in an English experiment,[1] in which the correlations between estimates, made by two competent and experienced observers, of the character qualities of 32 children were found to be extremely low.

¶ 14. THE IMPROVED INTERVIEW. The psychologist, unlike the ordinary interviewer, does not trust to casual observation of such of a person's characteristics as happen to obtrude themselves on his attention during a brief and desultory conversation. He approaches the interview with a definite plan of attack. In the first place he draws up a list of the particular tendencies for which he proposes to look. One such list,[2] for example, contains twenty-four qualities, twelve 'primary' and twelve 'secondary'. The first group is based on McDougall's classification of the instincts, and includes submissiveness, fear, assertiveness, sociability, anger, tenderness, cheerfulness, sorrow, sex, disgust, curiosity and acquisitiveness. The second group contains such qualities as self-confidence, initiative, industry, honesty, reliability and co-operativeness.

[1] *Cf.* C. Burt and others; *A Study in Vocational Guidance;* H.M.S.O., London, 1926.

[2] *Ibid.*

In the second place, the psychologist, having mapped out the ground to be covered, devises exploratory questions of a kind likely to elicit the information he requires. Every examiner gradually builds up his own technique of questioning and is continually endeavouring to improve it. The psychological interview is not, however, completely standardised; it is not a rigid questionnaire in oral form. The interviewer is constantly on the watch for clues which may present themselves in the subject's spontaneous remarks and, if tactfully followed up, may lead to illuminating discoveries. A certain measure of freedom is essential, but haphazard remarks and fruitless digressions are avoided, the conversation being systematically directed towards those topics which experience has shown to be the most useful.

¶ 15. THE RATING SCALE. Thirdly, the psychologist uses specially prepared forms for recording his conclusions in a precise and comprehensive way. A device commonly employed is the 'rating scale', the child being assigned, for each quality studied, a grade letter or number according to the degree in which the quality is judged to be present. For example, the names of the qualities may be printed in tabular form, each being followed by five letters, round one of which the examiner places a ring to indicate his assessment. Thus:—

Sociable	a	b	c	d	e
Cheerful	a	b	c	d	e
Assertive	a	b	c	d	e

The letter c denotes an average degree of the quality in question, b and d signify degrees above and below the average respectively, while a and e are encircled only when the quality is judged to be unusually strong or unusually weak. For greater exactness the grades may be defined on a percentile basis. The a category, for instance, may be reserved for individuals who, in respect of any particular quality, would fall within the top 5 per cent. of the general population, the b category for the next 25 per cent., c for the middle 40 per cent., d for the next 25 per cent., and e for the lowest 5 per cent. To achieve such precision in practice is difficult; but a scheme of this kind, when kept in mind as a guiding principle, certainly helps to give consistency to the examiner's judgements.

The rating scale, although a useful tool, has obvious limitations. As Bingham and Moore[1] have emphasised, its value depends on the way in which it is constructed and the skill with which it is used. "At its worst, the rating scale may become a substitute for good judgement, and by its superficial appearance of scientific objectivity lead to an erroneous assumption that a personality has been accurately measured. At its best, a well-constructed rating scale aids the interviewer in focussing his attention on the relevant traits, and in recording his judgements with greater accuracy and consistency than otherwise would result from a general impression."

[1] *Cf.* W. V. D. Bingham and B. V. Moore; *How to Interview;* New York, 1931.

¶ 16. GENERAL CONDUCT OF THE INTERVIEW. But the great art of the interviewer is the art of securing the whole-hearted co-operation of the subject. Unless this is achieved, the mere systematisation of the questions and the records will be of little avail. The good interviewer thinks himself into the position of the person being interviewed and unconsciously adapts his manner and his language to the circumstances of the particular case. In general a quiet, calm demeanour, natural and friendly without undue familiarity or effusiveness, is the most effective. There must be no air of superiority, no hint of a patronising attitude, no 'talking-down' to the child, such as is often indulged in by the latter's ordinary advisers. Constant encouragement is essential; any suggestion of criticism is fatal. The child must be made to feel that he is in the presence of a friend in whom he can confide and whose primary object is neither to praise nor to blame but simply to understand and to help.[1]

The child's initial attitude is carefully observed and may be very suggestive. Often he shows a certain degree of anxiety or suspicion which a friendly chat may help to allay. To begin the examination with an interesting practical test which the child can perform unobserved has the double advantage of placing him at his ease and setting the examiner

[1] A young journalist hit the nail on the head when she began an account of a vocational interview with these words:—"I have just been choosing a career for myself with the help of a man who asked awkward questions in such a kind voice that I told the truth".—(*Daily Express*, 7th October, 1932.)

free to interview the parents in an adjoining room. The Picture Completion Test,[1] whatever may be its value as a measure of ability, is undoubtedly useful as a 'shock-absorber'. The child enjoys puzzling out the problems and soon begins to feel at home in his strange surroundings.

As the examination proceeds, a careful watch is kept for indications of temperamental tendencies. Many of the child's qualities reveal themselves in his manner of attacking the various test problems. One notes, for example, whether his general procedure is deliberate or impulsive, whether he perseveres in face of difficulties, whether he preserves his calmness when he finds himself in error, whether he seeks to explain away his failures, and so on. The test of literary expression has an incidental usefulness in bringing to light particular attitudes and interests. The following 'extensions of summaries',[2] for example, helped to confirm temperamental judgements based on general observation.

The Civil Service

"The Civil Service offers a safe post, with ample security, and certainty of adequate pay. It is true the work may be very monotonous to some people, but those who feel that way should go and shoot lions and tigers or such like adventurous jobs. Other folk may go in for Stock Exchange Bull and Bear Baiting, but one day down comes the market and they then wish they had something like a Civil Servant's salary and prospects of pension, for after all, he may not

[1] *Cf. supra*, p. 57.
[2] *Cf. supra*, p. 73.

have a chance of making a million a day, he can have a nice house in Golder's Green, run an Austin Seven, and tour in Europe in his holidays, of which he has plenty. Some people would wilt away for lack of publicity in the Civil Service, and to them the idea that they were working for the common weal would, if suggested as a reason for their continuing in the Service, would just die of apoplexy".

The Heath

"Slowly the sun passed from the sky. All day had he struggled but now darkness won. Throughout a lone and weary land were heard stirrings of evil; unutterable suggestions of horror came from every side. . . . A cloak of primitive fear covered the earth. Faint and thin, borne by the moaning wind, came the loneliest cry that ever has saddened mortal heart, sheep calling to sheep across the vast emptiness. 'Tis the orchestra of the moors. The shepherds know that sound; you can read its sorrow in their eyes. . . . By a dark pool of foul water the Little People could be felt, winding their evil dance. Hopeless and full of despair seemed the half-light of evening. Only in the West, high on rising ground, black-dark against the last blood gleams of the conquered sun, stood the eternal challenge of the triumphant Cross, unconquered and undying. In the land of evil stood the standard of the field of Heaven".

In the intervals between the tests the examiner engages the child in friendly conversation, gradually establishing *rapport* until, by the time the testing has been completed,

the child is usually disposed to discuss himself and his problems with considerable candour. The final interview ranges over his school experiences in work and in games, his domestic relationships, his leisure activities, his general interests and attitudes, his ambitions and ideals. The discussion of favourite hobbies generally yields most useful indications of temperamental tendencies; but antipathies may be just as significant as preferences, and the examiner dose well to explore the child's attitudes towards all the commoner types of activity, both occupational and recreational.

¶ 17. THE STUDY OF VOCATIONAL INTERESTS. In America the questionnaire is commonly used for the exploration of vocational interests; the child is presented with a more or less lengthy list of occupations (beginning with 'actor' and ending with 'Y.W.C.A.' worker) and is required to indicate in each case a liking or a dislike or an uncertain attitude by marking one of the symbols 'L. ? D.'. A less time-consuming method is to present descriptions of general occupational conditions rather than names of specific vocations. Thus the child may be asked whether he would like "a safe occupation with fixed pay and regular holidays and a pension at the end of it", or "an occupation in which you would have to move about from place to place", or "an occupation in which you would be responsible for planning the activities of others". Printed forms of this kind are definitely useful, especially when children are examined in groups; but it is always desirable that the child's answers should be discussed during the interview

so that the reasons for his likes and dislikes may be investigated. It is also of the greatest importance that the examiner should pay careful attention to the child's changing attitudes as revealed by gesture, facial expression, and tone of voice. To the shrewd observer these things are often far more meaningful than the mere verbal responses.

Another method of discovering emotional attitudes through the study of vocational interests makes use of pictures showing men engaged in various trades. The child is given a series of these pictures and is told to sort them into three piles according to whether he would like or dislike "to be the man in the picture" or whether he "would not mind either way". He is then asked to explain his likes and dislikes. This method was used in a recent English experiment and the explanations offered by the children were often extremely suggestive. "Note, for example, the explanations given by one boy for putting the following cards in the 'dislike' group (he put only three of the total of thirty cards in the 'like' group).

Coster with vegetable barrow.	'Frightened you'd get locked up'.
'Zoo' keeper feeding cranes.	'Frightened of children doing harm to the animals'.
Ploughman on the Downs.	'Catch a lot of germs and illness. They get into the grass and that'.
Postman collecting letters.	'Frightened of losing letters and getting into trouble'.

Subsequent follow-up of his industrial history showed that this boy had nineteen posts in twenty-two months; three of them were held for less than a week, and only one for

more than three months. The few reports on his work and reasons for leaving that it was possible to obtain were all ambiguous, but the above explanations suggest that irrational fears would be likely to play an important part in his career".[1]

¶ 18. INVESTIGATION OF CHARACTER DEFECTS. Tact is especially necessary in the exploration of character deficiencies, which should be discussed in a matter-of-fact, unemotional way as if they were interesting facts rather than reprehensible faults. Here, as various writers have pointed out, an indirect approach is the most helpful. A candid reply is much less likely to be given to the question 'Do you often behave badly in school?' than to the question 'Do your teachers often get annoyed with you?' When unhappy family relationships are suspected, the question 'Which of your parents would you say that you are friendliest with?' if put to the child with a reassuring smile and in a tone of voice which suggests that it is the most natural thing in the world to prefer one parent to the other, will often pave the way for an illuminating disclosure of domestic animosities. In general, the unhappy child finds it easier to unburden himself to a sympathetic stranger than to his parents or teachers, who are often responsible for his troubles; and even the happy child will shyly confess to ambitions which, for fear of being laughed at, he has never talked of at home or in school.

[1] *Cf.* F. M. Earle and others; *Methods of Choosing a Career;* London, 1931.

¶ 19. TEMPERAMENTAL SELF-ANALYSIS. One of the most useful aids to the interview is a printed list of temperamental qualities which the child is asked to check in accordance with his own estimate of himself. This is a device which raises a cynical smile on the faces of those who have not given it a trial, but it is one which the experienced examiner would not care to be without. The truth of the estimates varies of course according to the individual's honesty, his modesty, his intelligence, his tendency to introspection, and his response to the examiner's efforts to capture his confidence; but in general boys and girls make no deliberate attempt at evasion or self-glorification, and, having once confessed their weaknesses on paper, they are the more ready to discuss them frankly in conversation. In a fairly long experience of the method with older pupils of the public and secondary schools and with university undergraduates the writer has met only one individual (a university man) who ascribed to himself all the virtues, leaving one pair of words (aggressive—unaggressive) unmarked because of a doubt as to which of the two contrasted qualities the examiner would consider the more admirable. This man had already been judged with considerable certainty to be a specious rogue; but his manner of completing the temperamental schedule helped to clinch the diagnosis. As a rule boys and girls, once they have caught the spirit of the interview, do not find the task of self-examination a very trying ordeal, and sometimes they apply themselves to it with great zest, as to a new and fascinating game. One young man has reported to the

writer that this experience was the foundation of a habit of critical observation of himself and of others which he has found of considerable advantage in his professional work.

¶ 20. EXPERIMENTS WITH THE INTERVIEW. Evidence of the value of the psychological interview was obtained in an interesting experiment conducted under the direction of Burt.[1] Thirty individuals, mainly children of school-leaving age, were interviewed independently by two psychologically trained observers, who used a five-point rating-scale in recording their judgements of the twenty-four qualities referred to above. The 'reliability', or self-consistency, of the method, as measured by the correlation between the judgements of the two psychologists, was found to vary greatly from one trait to another. The highest correlation coefficient (for the quality of submissiveness) was .85, a figure that would be thought extremely satisfactory if obtained in an investigation of the reliability of a mental test. In general, the 'primary' qualities, especially those which are distinctly emotional and are excited by human relations—sociability, timidity, assertiveness, submissiveness and the like—proved the easiest to assess. Tendencies such as acquisitiveness and curiosity, which have little accompanying emotion, were extremely difficult to judge. Satisfactorily high correlations were found for such of the 'secondary' qualities as spontaneously emerge in the performance of tests, the highest being .77 (for the

[1] *Cf.* C. Burt and others; *A Study in Vocational Guidance;* London, 1926.

quality of self-confidence). The reliability of the estimates of moral qualities, such as honesty and reliability, was disappointingly low.

The experiment was repeated with a smaller group of subjects, who were mainly young adults. Each of the subjects was interviewed by at least four psychologists who were already well acquainted with the persons to be judged, and by one additional psychologist who was a complete stranger. The reliability of the estimates of the acquaintances was found to be high, although again the primary qualities were found easier to judge than the secondary. In the case of one subject the correlation between the judgements of the acquaintances and those of the subject himself yielded, for the primary qualities, the extraordinarily high figure of .93. For the secondary qualities the figure was .69. These judgements were used as criteria in determining the accuracy of the stranger's estimates; and for the primary qualities of the subject just referred to no more satisfactory criterion could be desired. In this particular case the stranger's estimates were found to correlate with the criterion to the extent of .70 for the primary qualities, and .58 for the secondary.

The report of the experiment states that "this, perhaps, is an exceptionally favourable instance by which to judge such estimates". (The average correlation of the stranger's estimates with the criteria was .58 for the primary, and .46 for the secondary qualities.) On the other hand, it should be noted that the experiment was conducted at a time when the improved methods of interviewing were new and when

the psychologists concerned were relatively unpractised in their use. Further, the interview was limited to a short conversation, and no tests or other aids such as have been described in this chapter were employed. It is not improbable that a similar investigation of the judgements of psychologists practised in the most up-to-date technique of vocational guidance would furnish more satisfactory results. But it is certainly true that such judgements are by no means infallible and that the opinions of parents and teachers should always be consulted, particularly in the estimation of the more complex moral characteristics. The contributions of the parent and the teacher are considered in the next chapter.

CHAPTER V

PARENTS AND TEACHERS

¶ 1. THE CONTRIBUTION OF THE PARENT. Parenthood is the most difficult of all occupations, and probably it is the one which contains the greatest proportion of misfits. It is a highly skilled art for which no training course has been provided; and it is one that is practised by multitudes whom no training course would render competent. The result is that many a child's occupational potentialities are limited because his personality has been warped or stunted by misunderstanding and mishandling in the home. But the good parent has an indispensable part to play in vocational guidance, and the worst of parents can make some useful contribution to the study of his child's vocational fitness. Even when his judgement of the child's characteristics is worthless, his description of the latter's behaviour may be of great value; and there is much information regarding the child's past history and family antecedents which the vocational adviser finds of considerable assistance and the parent alone can supply.

¶ 2. PARENTAL JUDGEMENTS OF ABILITIES. In general, parents are not good judges of the intelligence of their offspring. Their deficiency in this respect is usually attributed to prejudice, as if an unbiased estimate were necessarily a true estimate. But prejudice certainly plays its part. The normal parent hopes that his child will be

clever and successful, and the wish is often father to the thought. Sometimes the most highly intelligent of parents remain strangely blind to deficiencies which are obvious even to the casual observer. It is so easy to find excuses for scholastic backwardness; one can blame the teacher, one can blame the "lack of concentration", one can blame the thyroid gland, and as a last resource one can fall back on the comforting theory of "late development". Often the sole explanation that does not occur to the parents is that there is a natural defect of mental capacity. They may have no illusions as to the child's beauty of form, they may readily admit that his character is not all that they could wish, but they will clutch at any straw that will save them from recognising a limitation of ability. A mother once insisted that her son was obviously intelligent because, although only 17 years of age, he had an excellent memory for the names of birds, whereas she herself (aged 45) was unable to tell the difference between a chaffinch and a missel-thrush. It was not easy to convince her that, despite this limited gift, the boy was definitely subnormal in general capacity.

Nevertheless, the intelligence test is not so infallible an instrument that the psychologist may safely ignore the observations of those who have been intimately associated with the child; and facts reported by the parent may be of definite value by corroborating, and occasionally by correcting, the estimate provided by the test. When a father announces that his boy is "very intelligent but frightfully slow", a discussion of the ways in which the slowness

manifests itself may afford helpful confirmation of a diagnosis of mental inferiority.

More useful, as a rule, is the parent's account of the child's special abilities as shown in his leisure activities, especially when the child is too unassuming to talk much about his own achievements. Of course, parental enthusiasm may be as misleading as childish modesty, but the parents' remarks often afford clues which may be followed up with profit in the vocational interview. Evidence of artistic capacities, which are not easily assessed by tests, is especially helpful. A full account of leisure interests is best obtained by asking the parent to check a printed list of all the commoner hobbies and recreations.

¶ 3. PARENTAL ESTIMATES OF TEMPERAMENT. When asked to describe his child's temperament and character the average parent is curiously tongue-tied. He will say that his son is "an ordinary sort of boy", or "rather sensitive", or "a good lad who always listens to his parents' advice"; and there his account of the matter ends. He has no map of temperament, no scheme for surveying the child's characteristics in a comprehensive way. It is necessary, therefore, to ask specific questions. The writer, whose experience has been mainly among parents of the educated classes, has found such parents by no means so biased in their estimates as they are commonly reputed to be. It is true that they often lack the opportunity of forming reliable standards by the study of children in general, but usually their analysis is candid and conscientious, and proves of con-

siderable value by providing a check on the examiner's estimates and by supplying indications of qualities such as are not easily assessed in the vocational examination. Often, indeed, there is little or nothing that the psychologist can add to the parent's description. But there is many a child who does not appear in his true colours at home; and there is many a parent who, through lack of psychological understanding, places a wrong interpretation on his child's behaviour. The wise examiner tries to elicit facts as well as inferences. Concrete instances of selfish or erratic or conscientious or persevering conduct are more helpful than mere expressions of opinion. Even Mr Woodley, although he found his son incomprehensible, could relate much about the boy's outward behaviour from which a psychologist could draw his own conclusions.

¶ 4. INVESTIGATION OF HOME CONDITIONS AND PAST HISTORY. The parent, in addition to aiding the assessment of the child's characteristics, can help the psychologist to understand how some of these characteristics have been produced, and herein perhaps lies his most valuable contribution to the study of the child's vocational problem. Particularly when deficiencies—intellectual, temperamental or educational—are present, it is important to investigate the child's domestic and social background and to search his whole past record for facts which may corroborate or explain the findings of the vocational examination. The discovery, for example, that development in infancy was abnormally slow helps to confirm a diagnosis of natural

dullness. When there is a marked discrepancy between capacity and achievement much light may be shed on the matter by the parent's account of the child's educational history. Inquiries are made regarding changes of school, interruptions in school life through health troubles or through residence abroad, inefficiency of teaching (an excuse to be accepted with due caution), maltreatment of the child by his masters or fellow-pupils, and so on. Information is sought in every case regarding scholastic distinctions, successes and failures in examinations, apparent strengths and weaknesses in particular subjects, and achievement in games and other school activities.

The investigation of temperamental defects may be greatly aided by the parent's description of the child's early history and his domestic circumstances. A tendency to anger or obstinacy which has manifested itself from the earliest years may be assumed to be innate, or at least to be so ingrained that it is likely to persist. Other deficiencies, when studied in relation to environmental conditions, may be regarded as probably temporary and remediable. Inquiries are made regarding the occupations of the parents, the numbers and ages and occupations of brothers and sisters, the family religious denominations, and any unusual home conditions or family relationships which may have affected the child's development. It may be very illuminating, for example, to find that a boy's mother died when he was a baby and that he has been brought up in almost monastic seclusion by his father, or that he has recently acquired a step-mother who is a real or imagined enemy,

or that his brother, younger but brighter than himself, has surpassed him at school, or that his mother's invalidism and his father's continual absences on business have combined to deprive him of the normal home supervision. In the following case—a very familiar one to all psychiatric workers—a simple fact disclosed by the parent at the vocational examination immediately cleared up what had been regarded as a grave and inexplicable mystery.

Case 7.—A girl who had been a model of good nature and quiet industry underwent, during her final term at a central school, what appeared to be a complete change of character. She became distinctly unruly, thereby causing consternation among her teachers—a consternation in which the girl obviously found considerable enjoyment. When the time came for her to leave school it was difficult to think of any occupation in which the child's undisciplined behaviour would not lead to a speedy dismissal. The teacher who sent her to the vocational psychologist provided a report on the girl's school record and home circumstances, omitting the one all-important fact. From the father, who brought the child to the examination, the information was elicited that a new baby had arrived in the family at a date which exactly coincided with the beginning of the girl's misdemeanours. The connection between the two events was plain. The girl, who had previously been the chief object of interest in the family circle, saw her place usurped by the newcomer, and her temporary aberration, unconsciously motivated, was designed to make her once more a centre of attention.

Inquiry is made not only into the child's personal record but also into the family history. Special family characteristics (artistic, inventive, roving, commanding, and the like), family health troubles (especially those which tend to be associated with a nervous temperament), and family occupational traditions, may all be very suggestive. Such facts as that a boy's grandfather was an eminent barrister or that his father ran away to sea at an early age do not in themselves constitute a reliable basis for any conclusions about the boy, but, when considered together with many other indications, they may be of some significance. They help to complete the picture.

Finally, the parent is consulted regarding future possibilities and plans. What further education can be afforded, what occupations are regarded with special favour, what opportunities exist of securing the boy or girl a suitable opening through personal influence—these are matters with which the adviser obviously must be acquainted.

¶ 5. METHODS OF OBTAINING INFORMATION. In dealing with boys and girls of the upper and middle classes it is convenient to obtain all the foregoing particulars by issuing to the parents a comprehensive and confidential record form which is completed and returned to the examiner before the date of examination. This procedure not only results in a great saving of time in the vocational interview, but also, by forewarning the examiner of the special difficulties (if any) of the case, aids him in his initial approach to the examinee. But a short personal interview with the

parent or parents, if not always essential, is often desirable, in order that doubtful points may be elucidated and supplementary inquiries made. And there are some parents—the too domineering father, for instance, and the too fond or too possessive mother—who render their greatest service simply by displaying, quite unconsciously, their own deficiencies to the examiner's gaze. A rapid summing-up of the problem parent is often a most helpful preliminary to the study of the problem child.

The psychologist who works among children of the so-called lower classes finds elaborate questionnaires of little use. Here the information must be obtained personally, and it can perhaps best be elicited by a trained social worker during a visit to the home. In an experiment among elementary school children in one of the less prosperous districts of London the homes were visited both before the children were advised and later for the purpose of inquiring into their occupational progress. The results of these visits were often very satisfactory, although they varied greatly according to the intelligence and co-operativeness of the mothers. "There were parents with a grievance—against the wilfulness of the modern son or daughter, against employers in general, against the system of education, or merely against life—which made it almost impossible to get any information of value".[1] In such cases the teacher, through whose hands several members of the family may have passed, can often give material assistance.

[1] *Cf.* F. M. Earle and others; *Methods of Choosing a Career;* London, 1931.

¶ 6. CRITICISMS OF THE TEACHER. Teaching is perhaps the profession which is most commonly adopted for totally inadequate reasons, and a prominent psychiatrist[1] has recently suggested that it is one which contains a disproportionately high percentage of misfits. However that may be, the literature of mental testing and of child psychology generally contains innumerable instances of children who were seriously misjudged in school. "The correlation between teachers' judgements [of intelligence] and mental tests", writes Freeman,[2] "may run from as low as .30 to as high as .60, or even higher. Some persons have a clear idea about what is meant by general intelligence, and are good judges of it; other persons either have a vague idea or are poor judges of individuals. On the whole, the tests, being more consistent, are to be relied upon more implicitly than are judgements". Terman[3] puts the matter rather more strongly:—"We have known so many bright children who were seriously underrated by their teachers that the necessity of the test method, as a supplement to observation, seems hardly open to question". More emphatic still is another American author,[4] who writes as follows:—"The teachers' impressions should be collected, but not accepted as of great importance. It has been proved

[1] Dr R. D. Gillespie, in a paper read at the Centenary Meeting of the British Medical Association, 1932.

[2] *Cf.* F. N. Freeman; *Mental Tests;* London, 1928.

[3] *Cf.* L. M. Terman; *The Intelligence of School Children;* London, 1921.

[4] *Cf.* A. F. Payne; *Organization of Vocational Guidance;* New York, 1925.

beyond doubt that teachers are poor judges of intelligence, that their impressions of effort and industriousness are based entirely upon the results accomplished rather than the effort put forth; in fact, they have no means of judging the effort except by the results obtained. Likewise, a teacher's impressions of personality are of little value. . . . So, while this information should be collected, it should not be taken too seriously. The information obtained from psychological examinations is of much more importance".

On the other hand, it was found in an English experiment that the correlation between teachers' estimates of intelligence and the results of the Binet tests amounted in one elementary school to .93, the average correlation for five schools being .74; and this high correlation was regarded by the investigators as evidence that the tests were satisfactory! But when it was a matter of estimating the accuracy of the psychologists' judgements of temperament, it was considered necessary to choose adult subjects because of the difficulty of obtaining a reliable control-rating of school pupils. "Opinions can generally be got from teachers, but these opinions are themselves often vitiated by the fact that they are seldom based upon sound psychological principles or expressed in unambiguous terms".[1] In a subsequent experiment the attempts of the teachers to use the unfamiliar technique of the rating scale in assessing temperamental qualities proved unsuccessful, an excessive proportion of the pupils being placed in the a and e

[1] *Cf.* C. Burt and others; *A Study in Vocational Guidance;* London, 1926.

categories; but it was found that the teachers "were in many cases able to offer very useful observations, and sometimes penetrating comments, on a child's behaviour in school".[1]

¶ 7. CO-OPERATION OF THE SCHOOL INDISPENSABLE. The truth of the matter, so far as the present writer can see, is as follows. Teachers, although their profession is one which sometimes makes for the development of a 'Jehovah complex', are only human. Consequently, like other mortals, they sometimes make mistakes in judging the characteristics of their fellows; and they have no cause to feel insulted, as some of them do, when it is suggested that the knowledge which they possess of their pupils may fall short of perfection. It is true that they have excellent opportunities of observing many aspects of the pupil's personality. On the other hand, as many a teacher has pointed out to the writer, the man or woman who instructs a large class in a day school may have little time to establish the individual contact with the child which makes for full understanding. Further, there is a very real danger that the teacher's estimate may be biased by the nature of the pupil's scholastic achievement, which, since it depends on a number of things, is not a very reliable criterion of anything. Again, even in these days of humane educational methods, there is often a barrier between teacher and taught which makes it difficult for them to achieve a com-

[1] *Cf.* F. M. Earle and others; *Methods of Choosing a Career;* London, 1931.

pletely frank and natural relationship. For these reasons, and also because teachers, like members of other professions, vary greatly in their fitness for their position, it is not to be expected that the information concerning the child which is obtained from the school will invariably be of the most full and accurate description. If the teacher were thoroughly trained in psychology and permitted to practise psychological methods of assessing individual differences, he would certainly make far fewer mistakes. But these methods, when applied by the psychologist in a single interview, are by no means so reliable that the results do not require to be supplemented by reports from the school. And to suggest that in general such reports are of almost no value is the height of absurdity. It is certain that, until the teacher turns psychologist, teacher and psychologist working together will obtain far better results than either can achieve alone.

¶ 8. THE TEACHER'S CONTRIBUTION. It is in the estimation of moral and social qualities that the teacher can give most assistance. He has the great advantage of being able to observe how the pupil behaves, not only as an individual, but also as a member of the group. But there are cases in which his judgement of intelligence is also of great value. The following is such a case, which incidentally shows how dangerous a mental test may be in the hands of the amateur who regards it as an automatic machine.

Case 8.—A boy of 15, a pupil of one of the public schools, obtained in the intelligence test a score which was distinctly below the average. His method of work was

exceptionally deliberate; he was an unusually independent boy who was not at all suggestible and who seemed to make little attempt to respond to the demand for speed. Consequently the examiner had serious doubts as to whether the test result should be regarded as indicating intellectual mediocrity and not simply temperamental peculiarity. The boy was inclined to be taciturn and was not easy to size-up in conversation. His masters were consulted and they gave it as their decided opinion that he was highly intelligent. A provisional recommendation was made that he should aim at an honours degree, the course which he himself desired. Subsequently it was ascertained that the boy had matriculated with flying colours and that, one year later, he had taken the Higher School Certificate. It is conceivable that his success was due to a combination of energy and luck, but the more probable explanation is that the masters' verdict was right and the verdict of the test definitely wrong.

Personal discussion with the schoolmaster may not always be possible; but in every case the parent is asked to furnish school reports, and from these the psychologist can often glean helpful information as to conduct and character, and can often discover evidence of the persistence of behaviour tendencies through many years. Sometimes, however, the information is too meagre or contradictory to be of much assistance. Recently the National Institute of Industrial Psychology has devised short questionnaires by means of which candid and systematic reports will, it is hoped, be obtainable in confidence from the schools.

The questions asked relate to social and leadership qualities and general behaviour and attitude to school work; and a three-point rating scale is provided for the answers. It is intended that several masters or mistresses should make the assessment independently, but that comments upon any subsequent discussion of the boy or girl should be included.

¶ 9. THE ASSESSMENT OF SCHOLASTIC ATTAINMENTS. From the ordinary school reports some notion may be gained of the pupil's general scholastic achievement and comparative proficiency in the different subjects. But indeed these reports are often the despair of the vocational adviser, as of the parent. The usual methods of setting and marking scholastic tests have recently been subjected to much well-merited criticism of a destructive kind.[1] The extreme unreliability of the examination of the traditional 'essay' or 'discussion' type is not a matter of mere opinion; it has been proved again and again by actual experiment. Ruch, for example, arranged that 115 teachers should mark three history papers; and he found that the marks awarded ranged, for the first paper, from 70 to 100, for the second from 45 to 90, and for the third from 25 to 85.[2]

In recent years a new type of scholastic test has been evolved, modelled on the group tests of intelligence. The questions are not, as in the traditional examination, few and long, but many and short; and thus a fair sampling of the

[1] For constructive suggestions *cf.* T. Thomas; *The Science of Marking;* London, 1930.

[2] *Cf.* P. Sandiford; *Educational Psychology;* London, 1928.

field is rendered possible. The pupil answers merely by underlining particular words or phrases or numbers, so that the child who lacks facility of expression or who, like Sentimental Tommy, has a restraining literary conscience, is not placed at a disadvantage. Most important of all, the scoring is standardised and objective, the 'personal equation' of the examiner being entirely eliminated. A fascinating discussion of the method is contained in Ballard's *The New Examiner*, where specimen tests devised by the author will be found. The 'new type' examination has had a considerable vogue in America, where its disadvantages are considered to be outweighed by its advantages. It is not yet commonly used in Britain; but a recent report of the Joint Advisory Committee of the Association of Education Committees and the National Union of Teachers suggests the advisability of experiment along these lines, and also recommends that a committee should be established to pursue and encourage research into the whole subject of the technique of examining.[1]

In an interesting American experiment quoted by Spearman[2] it was found that when pupils were obliged to work as hard as possible at all their subjects the correlations between their achievements in the different branches of school work increased so markedly as to suggest that success in all subjects is due very largely to the general factor of intelligence, and that specific abilities are of little importance. However that may be, boys and girls normally

[1] *Cf. Examinations in Public Elementary Schools;* London, 1930.

[2] *Cf.* C. Spearman; *The Abilities of Man;* London, 1927.

show considerable variations in interest and proficiency from one subject to another, and the vocational examiner must discover these differences as best he may from school reports and personal discussions.

¶ 10. THE CUMULATIVE SCHOOL RECORD. A recent innovation in educational practice that is of particular interest to the vocational psychologist is the use of the cumulative school or college record form. The pupil's achievements, both in standardised tests and in subjectively scored examinations, are recorded graphically, so that the reader may see at a glance the main trends of his development throughout the entire school or university course. Space is provided for 'personality ratings', unusual accomplishments and defects, athletic and other extra-curricular activities, special interests and vocational preferences, holiday vocational experiences, and so on. Notable examples of the cumulative record form are reproduced and explained in a most interesting publication of the American Council on Education,[1] from which the following illustration of the value of such records to the vocational adviser is taken.

A young man came to college with the somewhat incongruous ambition of becoming a writer, an ambition acquired partly through the influence of an uncle engaged in journalism. The cumulative record of the youth's spare-time activities showed a consistent interest in mechanical pursuits. During his last year in the high school he had

[1] *Cf. The Educational Record Supplement*, No. 8, 1928.

operated an amateur wireless station. After entering college he constructed a "perpetual motion machine", made an electric motor from second-hand parts, and built a small yacht. He took an active part in the work of the college Kodak club and edited the "steel and stone bridges" section of the club's year book. In his summer vacations he worked in a radio station and as a telephone linesman's assistant. And all the time his desire to become an author persisted. Although comparatively successful in Mathematics and Physics, he obtained mediocre marks in English and had painful difficulties with French. Improvement in French was effected largely as a result of his accepting the suggestion that he should read articles in that language on science and engineering subjects. But it was not until he had reached his third year of university study that he was induced to adopt engineering as his career.

In the account of this case it is emphasised that no one of the many items of information recorded would justify definite conclusions as to the youth's vocational bent. "It is the *cumulative effect of objective observations concretely stated*, showing glimpses of his conduct under varying circumstances and spread out over a series of years, that delineates his real bent, that manifests the persistent interests that dominate his life, and that demonstrates the fortuitous character of his earlier choice of a profession. It seems clear that his true bent could have been equally definitely ascertained during the secondary school period, and one who witnessed the intense suffering of this man during his first two years in college cannot avoid reflecting on the saving

which might have been effected for him if the process of weaning him away from the mistaken (but sincerely and tenaciously maintained) ambition to become famous as a writer had been begun earlier".

¶ 11. HOME AND SCHOOL. A chapter on parents and teachers cannot be concluded without reference being made to the desirability of the home and the school co-operating not only with the vocational adviser but also with each other. Here again America has set a worthy example with its Parent-Teacher Associations; and in Britain a successful start has been made through the initiative of individual school authorities and the excellent work of the recently instituted Home and School Council. It may be hoped that, as a result of the activities of such organisations, the number of pupils who by the time they reach the age of vocational choice have become 'problem cases' will be materially reduced.

CHAPTER VI

THE DOCTOR'S CONTRIBUTION

¶ 1. IMPORTANCE OF MEDICAL ASSISTANCE. The newer methods of vocational guidance have been devised and practised, in the main, by non-medical psychologists; and individual differences in *physical* capacity among boys and girls seeking advice on the choice of employment have not always received the attention which they deserve. In the American literature this aspect of guidance is given almost no consideration. Kitson,[1] for example, dismisses the matter thus:—"By the physiological point of view we mean the condition of the organs of the body—heart, lungs, digestive system, sense organs, etc. Certain occupations make special demands on various organs of the body. For example, to be an aviator one must be able to maintain his sense of direction even when he is flying head downward, and he must be able to endure the reduced air pressure of high altitudes. A few other occupations make special demands, but most lines of work can be safely entered by one who has the physiological equipment of the average person".

The truth is that human beings differ as widely in their physical as in their mental characteristics and that—even in America, as was shown by the examination of army recruits during the Great War—a large percentage of them are physically defective. Further, even in these days of mechanised labour, industrial occupations vary greatly in

[1] *Cf.* H. D. Kitson; *I Find my Vocation;* New York, 1931.

respect of the physical strains which they impose, as well as in respect of the risks of injury and disease which they entail. It follows that a well conceived scheme of vocational guidance necessarily makes provision for a careful physical and medical examination of the child leaving school.

¶ 2. INADEQUACY OF EXISTING MEDICAL AGENCIES. A visitor from America has assured the writer that in that country the school medical officer and the factory physician perform their work so efficiently that there is little danger of the child obtaining employment unsuited to his health or physique. Even if this is true, it would seem to be important that the functions of the psychologist and the physician should be closely co-ordinated, as otherwise there is a distinct possibility that the one may recommend work which the other may judge to be inappropriate. But it is very questionable whether, either in America or elsewhere, the purposes of vocational guidance are always adequately served by the existing medical agencies, educational and industrial. An investigation of the health of a representative group of about 400 New York boys and girls, aged fourteen to sixteen, showed that three-quarters of these children had two or more physical defects and that approximately half of them had some defect which was being accentuated by the work in which they were engaged.[1] A report of the Massachusetts Department of Labour "describes the tragedy of a boy with badly defective eyesight, certified

[1] *Cf. The Health of the Working Child;* New York State Dept. of Labour, 1924.

for work where there were machines, who as a result lost some of his fingers. Another boy who had epileptic fits was certified for employment, apparently without an examination, and lost his life while running an elevator".[1] And a careful enquiry recently conducted by the National Tuberculosis Association of America led to the conclusion that physical examinations of children entering industry are in general poorly done, "because of a desultory interest in the proceeding", the average examination being merely a hasty "going through of motions required by law".[2]

¶ 3. THE SCHOOL MEDICAL OFFICER. In Britain the school medical officer does not usually attempt to assess the child's capacity for different kinds of work. The main object of his examinations, which are made at very infrequent intervals, is to ensure that the child is physically fit for the educational course provided and that, if defects are present, appropriate treatment is arranged. The final examination may take place two or three years before the child leaves school. When physical deficiencies are recorded on the school-leaving form, they are often described in technical language which conveys no exact meaning to the lay persons responsible for aiding the child in his vocational decision. Very frequently the medical section of the form

[1] *Cf.* C. Dinwiddie; "Health Protection for Working Children", *Proceedings of 26th Annual Conference of the National Child Labour Committee;* New York, 1931.

[2] *Cf.* V. R. Anderson and M. Nelson; *A Study of the Physical Examinations of Children Entering Industry;* New York, 1930.

contains only the one word, 'normal', or the two words, 'no observations'. It is as if the psychologist, in estimating mental capacity, were to recognise only two classes of children, those who can be said to be mentally defective and those concerning whom there is nothing to be said at all! The 'normal' children are the clinically healthy children, who show wide variations in physique and stamina, variations which must often be assessed in an extremely rough and ready way by the non-medical vocational advisers. To say all this is to cast no reflection on the ability or conscientiousness of the school medical officer, who does all that is expected of him and doubtless has no time to do more. It is not his fault that vocational guidance is not regarded as an important part of his activities.

¶ 4. THE FACTORY MEDICAL OFFICER. If the child has been wrongly advised on leaving school there is a possibility that the wrong may be righted; for the law ordains that no young person below the age of 16 may be employed in a factory (or in certain classes of workshop) for more than seven days unless he has been certified as physically fit for the work in which he is engaged. The certificate is commonly provided by a public official known as the Certifying Factory Surgeon; but many of the larger industrial firms prefer to employ their own medical officers for the purpose. The certifying surgeon and the factory physician render a valuable service by rejecting applicants for work whose physical condition would render them a danger to themselves or to others in the occupations

desired. But to be rejected—or, for that matter, to be accepted—is not to be guided. Often the doctor takes no part in the allocation of the most suitable tasks to those who are engaged; and often he sets a uniform standard of fitness for all new workers, with the result that many are rejected who might perform the lighter operations with complete efficiency. That all is not well with existing arrangements is evidenced by the suggestions, official and unofficial, which have been made as to the desirability of a closer liaison between the school medical officer and the factory surgeon, or of an extension of the responsibilities of the former official whereby his work would include the examination of young persons in factories. Some writers on the subject seem to assume that the school medical officer has a knowledge of the child's constitution comparable with the knowledge of his patients possessed by the good family physician. Whether this is so one is inclined to doubt when one considers that the child takes his place in the inspection queue only twice or thrice during his nine years of school life. But it is certain that the school medical officer could play a much more useful part in vocational guidance than he commonly plays at present.

¶ 5. HEALTH MEASURES IN INDUSTRY. In recent years a great amount of effort has been devoted to the removal of the many dangers to health consequent on the industrial revolution of the last century. In certain trades in which the worker runs a risk of contracting serious diseases—through the inhalation of dusts, for example, or the absorp-

tion of poisonous substances—he is not only subjected to a stringent medical examination before being engaged, but is also re-examined at frequent intervals in order that the earliest signs of disease may be detected; and means have been devised both of minimising the dangers and of increasing the worker's defences. Moreover, throughout industry generally, and not merely in the so-called 'dangerous' occupations, the researches of industrial psychologists and physiologists have resulted in practical measures of a most beneficial kind.[1] Needless fatigue has been eliminated by improvements in methods of work and in arrangement of materials and by the introduction of scientific 'rest-pauses'; and working conditions have been ameliorated by attention to such matters as ventilation, lighting and temperature.

Such measures are of the greatest value in promoting the health of the workers generally. In vocational guidance, however, one is dealing not with workers generally but with individuals; and the betterment of working methods and conditions will not suffice to prevent damage to an individual's health if his work is fundamentally unsuited to his physical condition. Two cases reported to the writer by a medical practitioner will make the point clear. The first is that of a girl who, despite the fact that her vision was very defective, succeeded in obtaining work as an embroideress, with distinctly unhappy results. The

[1] *Cf.* C. S. Myers; *Industrial Psychology in Great Britain;* London, 1925; and the numerous reports of the Industrial Health Research Board; H.M.S.O., London.

second is that of a man with heart disease and bronchitis whose work consists in carrying heavy carpets about in a big store. The physician remarks:—"The exertion doesn't help his heart and the carpet dust doesn't improve his lungs. He will have to give up soon". Both individuals are, physiologically, square pegs in round holes; and no improvement in their conditions of work would make them anything else.

¶ 6. THE ASSESSMENT OF PHYSICAL CAPACITIES. The technique of the medical examination for vocational guidance is the technique of medical examinations generally, but special attention should be paid to physiological and pathological conditions such as render an individual particularly fitted or unfitted for different kinds of occupation. In the first place, it is desirable that an estimate should be made of the child's general physical robustness; for work which imposes an excessive strain on his strength and endurance may cause direct bodily injury, or may produce a state of chronic over-fatigue with increased liability to sickness and to accidents. Unfortunately the physician, although he usually despises psychology as being 'unscientific', has not been able to devise any objective method of assessing general physical efficiency which can compete in reliability with the psychologist's method of gauging general mental efficiency. Some investigators have regarded the state of the child's nutrition as the truest indication of bodily fitness and have tried to obtain a measure of such fitness by working out the relationship between height and weight. Others

have included chest measurements in their calculations. Others again have taken measurements of muscular strength, either absolutely or in relation to bodily weight, as the criterion. By such methods attempts have been made to work out a 'fitness factor' or 'coefficient of robustness', comparable with the mental ratio used in psychological measurements; but there seems to be general agreement that great reliance is not to be placed on the figures so obtained. When tests and measurements fail, however, the physician can provide, as a result of his observations in a careful clinical examination, a subjective rating on a scale such as is used by the psychologist in his estimation of temperament. This procedure is certainly much more satisfactory than the usual plan of singling out the unfit and relegating all degrees of fitness to the single category of 'normal'.

Of particular physical capacities perhaps the most important are visual and auditory acuities, but any special bodily strength—marked respiratory efficiency, for example—should be noted and recorded; for in the physical, as in the mental sphere the aim should be not merely to save the child from work in which he would prove incompetent, but to direct him to work in which his powers will be used as fully as possible.

¶ 7. THE ASSESSMENT OF PHYSICAL DEFECTS. Often, however, an occupation that seems admirably adapted to the child's physical capacities is judged to be quite unsuitable on other grounds. Therefore, although the physician

should, when possible, supply positive guidance, his chief usefulness doubtless lies in the provision of negative indications, based on his observation of physical deficiencies. Here again it would seem to be desirable that an attempt should be made to grade as precisely as possible the conditions discovered. The single word 'hernia' covers defects of different kinds and of various degrees of severity, and occupations which are undesirable in one case of hernia may be suitable enough in another. As has been pointed out in a publication of the National Industrial Conference Board of America,[1] an exact classification of defects is not only of assistance in systematising the work of vocational guidance, but also facilitates the task of checking the soundness of the vocational advice, which must often be of a tentative nature, by subsequent study of the individual's physical condition and industrial progress, and comparison of the results with the findings of the original examination.

¶ 8. THE PROBLEM OF DIATHESIS. In addition to noting physical defects, such as hernia, flat feet or varicosity, and diseased conditions, such as chronic bronchitis or valvular affections of the heart, the physician assisting in vocational guidance should perhaps try to diagnose the signs of predisposition to particular maladies. The old doctrine of 'diathesis', or hereditary taint, has for some time been out of fashion, the science of bacteriology having shown that many diseases are due to an infective agent from without

[1] *Cf. Medical Care of Industrial Workers;* New York, 1926.

the body rather than to a weakness within. Recent investigations, however, suggest that, important as the seed doubtless is, the soil may be of some importance also.[1] The matter is of interest to the vocational adviser, who must strive to prevent not only the aggravation of existing defects, but also the development of abnormal conditions to which the child may be specially prone.

¶ 9. REMEDIAL WORK. In some cases the physician may be able to recommend an occupational course which, in addition to being otherwise suitable, is calculated to remedy, or at least to ameliorate, an unsatisfactory physical condition. But care must be taken to avoid an undue insistence on medical indications when they conflict with those of the psychological examination. When a tuberculous boy who is temperamentally unsuited to an agricultural life is made to work on the land, his mental dissatisfaction may be such that the effect of the occupation on his physical state is the reverse of beneficial. And probably there are few persons who would not prefer a happy, if slightly curtailed, existence to a longer span of days in uncongenial surroundings.

¶ 10. ACCIDENT PRONENESS. It has been shown that some persons are particularly prone to industrial accidents, although the factors which constitute this proneness have not yet been exactly defined. Certain physical conditions, such as epilepsy, monocular vision, and excessive fatigue, are sources of danger; and the medical examination may

[1] *Cf.* Sir A. Garrod; *The Inborn Factors in Disease;* Oxford, 1931.

be of value by indicating the desirability of avoiding work of a hazardous kind. But psychological conditions are perhaps of greater importance. Farmer and Chambers have attempted to detect accident proneness by applying tests for sensory-muscular, or 'æstheto-kinetic', co-ordination, and they have concluded that these tests do measure at least one important factor in accident causation. They found that the accident rate of the worst 25 per cent of their subjects in the tests was approximately twice as great as that of the remaining 75 per cent.[1]

¶ 11. TERMINOLOGY. The medical examination, however thorough, will be of limited value unless the physician passes on the results to his lay collaborators in language which they can understand. If he is not sufficiently acquainted with the local occupations to indicate particular employments of a desirable or undesirable kind, he can at least provide positive and negative indications in terms of general occupational conditions. He can state, for example, that the child is unfitted for work involving climbing, prolonged standing, or exposure to the weather; for work requiring dry hands or normal colour vision; or for work which is carried on in a damp, hot, or dusty atmosphere. Time may be saved, and thoroughness encouraged, by the provision of a special form on which the physician not only enters his detailed observations, but also checks a comprehensive list of occupational conditions such as those just mentioned. This plan is followed in many vocational

[1] *Cf.* E. Farmer; *The Causes of Accidents;* London, 1932.

guidance offices on the Continent, and it has been adopted in recent experimental work in Britain.[1] The information thus provided is of immeasurably greater value than vague references to bronchitic 'râles' and cardiac 'murmurs'.

¶ 12. TENTATIVE NATURE OF CONCLUSIONS. Physical assessments made at the age of puberty may not be extremely reliable, and a condition of low vitality may sometimes be merely a temporary result of unhygienic home conditions. Further, the worker's physical adjustment to his work may be affected by the manner in which he spends his energies during his hours of leisure. For these reasons, and also because practically no research has yet been undertaken with a view to determining the minimum physiological requirements of different occupations, the physician finds it difficult to make dogmatic pronouncements. He must often be content to predict probabilities rather than certainties. His consolation must be that vocational decisions aided by his intelligent guesswork are likely, in general, to be more appropriate than those determined purely by chance.

¶ 13. THE MEDICAL SPECIALIST. The vocational guidance physician may sometimes require specialist assistance—for example, in the investigation of endocrine deficiencies or of derangements of the auditory apparatus such as may be of importance in relation to occupations of a noisy

[1] *Cf.* F. M. Earle and others; *Methods of Choosing a Career;* London, 1931.

character.[1] The authors of a French book[2] on vocational guidance have emphasised the desirability of employing radiography for the confirmation of doubtful diagnoses of chest conditions; and in Vienna there is a complete panel of medical and surgical consultants to whom children seeking advice at the municipal vocational guidance office may be referred.

¶ 14. THE PSYCHIATRIST. One specialist whose services are almost indispensable is the psychiatrist, unless the vocational guidance doctor is himself experienced in psychiatric work. The ordinary medical man is not very skilled in the diagnosis of mental abnormalities, and the psychologist with a merely theoretical knowledge of psychiatry, although he may be able to detect the minor emotional maladjustments of the adolescent and to offer appropriate advice concerning them, is bound to make mistakes in his estimates of graver conditions. If he is wise, he will offer only provisional advice on the vocational problem in such cases until it is seen what results can be achieved by psychiatric treatment.

Case 9.—A girl who had thought vaguely of becoming a social worker appeared to have a nervous temperament, with very marked tendencies to solitariness and diffidence.

[1] *Cf.* T. R. Rodger; "Occupational Diseases: Ear, Nose and Throat", *Occupation and Health*, Brochure 279; International Labour Office; 1932.

[2] *Cf.* J. Perret, P. Mazel et B. Noyer; *L'Orientation Professionelle;* Paris, 1926.

She was advised to take up secretarial work in a quiet situation where she would be dealing more with papers than with people. Soon afterwards she sought the advice of a psychiatrist, who applied psychological treatment and effected a marked improvement in the girl's social adjustment. When the treatment was completed she became a saleswoman and found this work particularly congenial.

When a man is unhappy or 'breaks down' in his occupation, it is by no means necessarily the occupation that is at fault. As Anderson[1] has shown, failure and unhappiness may be due to emotional conflicts quite unconnected with the work. But there is much mental ill-health that is caused or aggravated by occupational maladjustment, and often the mental abnormality masquerades in the guise of physical disorders, of the heart or the digestion, for example. In certain special cases—the so-called 'occupational neuroses'—seriously disabling physical symptoms are produced. George Eliot expressed a well-known truth when she wrote that "men's muscles move better when their souls are making merry music"; but modern psychiatrists have made the surprising discovery that discord in the soul may cause a muscle to cease functioning altogether. For instance, telegraphists' cramp is a condition in which the worker is incapacitated through a spasm of the muscles employed in the performance of his task. A recent investigation of this condition led to the conclusion that the physical symptom is not, as was formerly supposed, due to a disordered action of the nervous mechanism involved

[1] *Cf.* V. V. Anderson; *Psychiatry in Industry;* New York, 1929.

in the normal functioning of the muscle, but is psychological in origin, its object being to rescue the worker from occupational conditions which, owing to his temperamental peculiarities, he has found too exacting. "Some cramp subjects would probably have suffered from a disabling psychoneurosis in whatever occupation they might have entered. Others, if in an occupation that did not exacerbate their temperamental abnormalities, might have worked happily and efficiently".[1] The psychiatrist, since he is constantly dealing with individuals who have broken down in their occupations, should be able to give valuable assistance to the vocational adviser in detecting young persons who are specially prone to maladjustment and in determining the careers in which such persons are most likely to maintain a satisfactory degree of mental health and efficiency.

¶ 15. THE GENERAL PRACTITIONER. The general medical practitioner is consulted on most of life's problems, including that of vocational guidance; and the suggestion has been made, in a leading article in a medical journal, that he is the man who should undertake the whole vocational examination, physical and psychological. Whether this would be an entirely satisfactory arrangement may be doubted, but the psychologist is not disposed to quarrel with the concluding words of the article referred to:—"if they [the medical practitioners] will not take the matter up for themselves, they must at least acknowledge what has

[1] *Cf.* M. Culpin; *Recent Advances in the Study of the Psychoneuroses;* London, 1931.

been and is being done. They can recommend the proper psychological examination of young persons who stand on the threshold of manhood and womanhood. We would go further and state that they fail in their duty if, there being any doubt as to fitness, they consent to a haphazard choice of occupation when it is possible to obtain an adequate psychological examination".[1] It is to be hoped that, as facilities for vocational guidance are extended, the psychologist will find in the general medical practitioner a valuable ally.

[1] *Cf.* "Vocational Guidance", *Medical Journal of Australia;* 26th July, 1930.

CHAPTER VII

STUDYING THE OCCUPATIONS

¶ 1. PRESENT KNOWLEDGE LIMITED. The chief methods of acquiring knowledge concerning the characteristics of the young person seeking vocational advice have now been reviewed. But it is of little use to assess the qualities of the prospective worker unless one has also assessed the qualities demanded by the work. The analysis of occupational requirements is obviously a most important part of the vocational adviser's task. This is a vast and difficult field of research in which comparatively little progress has yet been made; and the present chapter must be concerned with future possibilities rather than with what has already been accomplished.

¶ 2. OCCUPATIONAL HANDBOOKS AND PAMPHLETS. When the vocational guidance of industrial workers first became a responsibility of the state, a need was felt for the publication of occupational inventories which would show what opportunities existed in the different localities; and printed handbooks and pamphlets began to make their appearance, designed to furnish, for the benefit of young persons and their advisers, information regarding the nature and conditions of the various trades. More recently many similar handbooks have been compiled for the use of boys and girls who have received a higher education. There are also journals which regularly publish up-to-date information

regarding vocational opportunities and training courses; and series of articles on careers occasionally appear in daily newspapers and in popular magazines. Indeed, the vocational adviser who sets out to collect occupational information has no difficulty in building up a library of some considerable size.

Many of these publications contain extremely useful accounts of the work of different professions and trades, including particulars of wages and prospects, apprenticeship schemes, health conditions, and so on. Very often, however, little if any attempt is made to estimate precisely the abilities and qualities desirable in the worker. The following descriptions are typical of many.

French Polishing.—"Skill and experience is required in getting the right colour and obtaining the best effect on different kinds of wood. The trade is not difficult to learn, but it is said that well-trained polishers are not easy to find. The actual application of polish requires considerable hand pressure as well as rubbing and is hard work".[1]

Dental Mechanics.—"There is a good demand for skilled workers, who make up sets of artificial teeth. A boy is best apprenticed to a private dentist, when he works under a skilled man for from three to five years. Premiums are sometimes asked. He needs to have a good education, and to be steady and plodding. A knowledge of metallurgy is very useful".[2]

[1] *Cf. A Guide to Employment for London Boys and Girls;* H.M.S.O., London, 1928.

[2] *Cf.* O. B. King; *Employment and Welfare of Juveniles;* London, 1925.

Kindergarten Teaching.—"As to the work itself—it opens up a field of living interest and offers a wide scope for the play of all the gifts and faculties of an intelligent and large-hearted woman".[1]

Comment on these descriptions is unnecessary. It will be evident to the reader that in each case the information given is far from adequate. Sometimes, indeed, the account of the duties to be performed enables the vocational adviser to infer something as to the qualities required, but often the assistance he receives in this way is very limited, and often he must search through a great deal of irrelevant matter in order to discover a few significant facts.

An improvement on the usual verbose, rambling and very incomplete occupational surveys is seen in an attractive series of pamphlets issued some years ago by the Vocational Guidance Department of the Chicago Board of Education. In these pamphlets an attempt is made not only to indicate briefly the general nature of the work and to give particulars of the necessary training courses and the normal financial rewards, but also to set forth in a concise, yet fairly comprehensive, way the physical and psychological attributes which the worker should possess. But the language of the psychological estimates is not standardised and is sometimes a little vague. One learns that the salesman requires "judgement" and that the teacher requires "poise"; but one is left wondering what precisely these terms mean and whether the teacher may not need just as much judgement

[1] *Cf. Careers and Vocational Training;* London, 1931.

as the salesman, and the salesman just as much poise as the teacher.

¶ 3. THE STANDARDISED SCHEDULE. Descriptive pamphlets serve a useful purpose in disseminating knowledge of the occupations among young people who are contemplating the choice of a career; but the vocational adviser must prepare his information in a more exact and systematic way. He has attempted to do this by using special schedules on which the essential particulars of any employment may be entered under certain standard headings. This method facilitates the comparison of one occupation with another and the classification of the various kinds of work according to the essential similarities discovered in the 'specifications'.

For example, there is a schedule, published by Edgerton,[1] in which the results of the occupational survey are set out systematically in fourteen sections. Much of the information relates to general conditions of work (hours, wages, seasonal variations, and the like), but there is an important section, headed "qualifications and training needed", in which are listed the essential characteristics of the good worker. The method of filling in the form is illustrated by a sample analysis of the work of the cashier-inspector (department stores). From this one discovers that the cashier should be able to manipulate money rapidly and that the other qualities which she must possess are "quick-

[1] *Cf.* A. H. Edgerton; *Vocational Guidance and Counselling;* New York, 1926.

ness, accuracy, patience, honesty, coolness, courtesy, neatness in personal appearance".

That is perhaps as far as most occupation-analysts have been able to proceed, but obviously much more than that is to be desired. It is surely important to know what degree of intelligence the cashier should possess, and one would like to have a fuller account of temperamental characteristics. Is the position one which satisfies, for instance, the very sociable individual, or is it one which appeals to the person of rather solitary disposition? Is it suited to the docile, acquiescent girl, or does it require a certain degree of self-assertion? Further, one would like to discover, if possible, the relative importance of the various characteristics desired. Is "accuracy" more important than "neatness in personal appearance", and what is the minimum degree of "patience" essential to the satisfactory performance of the task? For light on some of these matters one looks hopefully to the final section of the schedule, which is headed "common deficiencies of workers", but all that one discovers here is "lack of interest in work and failure to realise opportunities the position offers". These words have a very familiar ring. They are the words of innumerable employers and supervisors, not only in the department stores of Detroit, but also in the factories and workshops of London. The naïve inclusion of them in an occupation analysis does not greatly advance one's knowledge of the occupation analysed. The important thing is to find out *why* some cashiers show "lack of interest in the work". The answer to that question might be rather illuminating.

¶ 4. THE PSYCHOGRAPH. The problem of analysing occupational requirements is discussed in a publication of the National Institute of Industrial Psychology,[1] where it is pointed out that the assessment of the work should be made on the same systematic plan as is followed in the examination of the child, and should, when possible, be expressed in quantitative terms. A mere list of desirable qualities is not enough. Just as one estimates the child's *degree* of intelligence, of mechanical ability, of physical strength, of cheerfulness and of self-confidence, so one must try to ascertain the degrees of these various characteristics demanded by the occupations. It is further suggested that the results of the analysis might best be recorded diagrammatically in the form of a 'psychographic profile'. In the construction of such a diagram horizontal lines are drawn to represent the various requirements of the occupation and a conspicuous mark is made on each line at a point corresponding to the estimated degree in which the particular ability or quality is demanded. At the top of the diagram there is a horizontal scale of percentiles, and from this scale vertical lines may be drawn so as to divide the horizontal lines into a number of segments representing, say, ten percentile units. Sometimes, for greater clarity, the marks made on the horizontal lines are connected by a zigzag, which enables the reader to see at a glance the features of major and minor importance in the work. The method may be used in the analysis not only of the work

[1] *Cf. Occupation Analysis;* Report No. I, Nat. Inst. of Ind. Psych.; London, 1927.

but also of the worker. As is remarked by Hollingworth,[1] who has published a number of sample profiles, "the chart is of course not absolutely necessary, since the figures tell the same story; but the graph presents the facts with a concreteness and vividness that the figures lack to all except those adept in their use".

The vocational psychologist dreams of a day when, having constructed a silhouette representing the characteristics of the person examined, he will proceed to superimpose this human profile on a number of occupational profiles until he finds one with which it exactly coincides. But in his waking moments he knows that that day will never arrive. Boys and girls are not fashioned after stereotyped patterns designed in relation to the needs of human occupations. Even if the measurements, both of the individual and of the occupation, were extremely exact (as they never will be), the difficulty of effecting a perfect vocational 'fit' would doubtless remain. But it does not follow that the attempt at precision should be altogether abandoned. Already some progress has been made in the quantitative assessment of human characteristics, and there would seem to be no reason why a corresponding improvement should not be effected in the analysis of occupational requirements.

¶ 5. INADEQUACY OF WORKERS' OBSERVATIONS. How, then, is the occupational information to be obtained? Common

[1] *Cf.* H. L. Hollingworth; *Vocational Psychology and Character Analysis;* New York, 1929.

sense suggests that the man in the work is the most competent judge of what the work demands; but common sense is wrong. The man in the work often lacks both the skill to observe and the language in which to express the results of his observations. Sometimes he attributes his efficiency to a number of moral virtues which are obviously useful in his occupation but equally useful in every other occupation; sometimes he explains that the key to success is to be found in a single word—"personality", or "judgement", or "adaptability". Martin has described the results obtained by a highly successful speciality salesman who agreed to inquire into the qualities essential to success in his own field. "The following extracts of his report show how vague are opinions even of sales managers of the qualities needed by their staff and how frequently futile is the help they afford to the psychologist in arriving at possible tests:—'The General Manager of —— believes success in selling *as in everything else* depends upon the possession of a trinity of qualities, *viz.*, zeal, knowledge and judgement. . . . The majority of opinions boiled down agreed that the ability to clinch an order depended on the Will to Win. . . . My own conclusions are that the test you want will demonstrate the possession of Judgement' ".[1]

The following observations of 'the man in the work' are quoted in an entertaining article published in an American journal. "The department store offers the greatest opportunity in the world for the man with ideas

[1] *Cf.* A. H. Martin; "The Psychological Practice of Vocational Guidance", *Australian Journal of Psychology;* June, 1930.

and originality. You don't have to be a man of extraordinary mental capacity to achieve success in the department store. It is the man who is willing to work and make sacrifices who gets there. . . . If you undertake public relations you will be devoting your life to action upon the belief that the safety and the future of the world is dependent upon the carrying out of the command: 'Know the truth and the truth shall make you free' ". Commenting on these and other similar pronouncements, the author of the article writes:—"Despite the scientific coolness of the several Job Analysers, their enthusiasm for their own particular job always seemed to get the upper hand, and so in the end the person seeking advice was still in doubt whether he ought to go to the department store and make sacrifices, or whether he ought to take up public relations and know the truth".[1] In England there has been published a booklet,[2] in which are recorded the views of many distinguished business men on the qualities which make for success in commerce; but the observations of these eminent persons are scarcely more illuminating than the remarks commonly made by centenarians when invited to explain the secret of longevity.

¶ 6. PSYCHOLOGICAL ESTIMATES. Clearly, the analysis must be made by a skilled psychologist, aided by representative workers. The psychologist should, when possible, actually

[1] *Cf.* A. F. Ratti; "Psychology as Fortune-Teller", *The American Mercury*, October, 1928.

[2] *Cf. Youth's Opportunity*, ed. R. B. Dunwoody; London, 1929.

observe the operations performed; if this cannot be done, he must obtain detailed descriptions of them. He should pay attention to the opinions of the workers as to the qualities required; for these opinions, erroneous though many of them will be, may sometimes serve as a useful check on his independent estimates and may sometimes indicate features of the work which otherwise would be overlooked. The writer has been told of an exceptionally sociable dentist who finds his work almost intolerable, since it involves continual contact with persons who are unable to talk, their mouths being otherwise occupied. The story, whether strictly true or not, serves to illustrate the possibility of certain psychological aspects of the occupation escaping the attention of the outside observer. Observation of the work should be supplemented by observation of the worker and by discussions with foremen and managers regarding the characteristics which seem to promote or to prevent efficiency in different operations.

These methods have been used in recent vocational guidance experiments among children leaving the elementary school,[1] but the occupations investigated have been limited in number and the estimates made have been, at best, tentative and inexact. Similar methods are being employed in the study of the higher professional and business occupations; and here attempts are being made, with the help of training colleges and professional associations, to collect information from large and representative

[1] *Cf.* F. M. Earle and others; *Methods of Choosing a Career;* London, 1931.

groups of workers by means of questionnaires. In one questionnaire, which is being circulated among women secretaries,[1] the worker is asked, in the first place, to supply a detailed account of her duties, and to state the particular parts of her work in which she is relatively happy and unhappy, and in which she considers herself relatively efficient and inefficient. She is then given a long list of statements applicable to different kinds of work, and is asked to mark those which apply to her own occupation—for example, "it gives opportunity for meeting all sorts of people", "it gives no emotional outlet; one cannot give play to one's feelings", "it is too mechanical". Next, she is requested to check a number of descriptions of persons—"the 'bookworm' ", "the born leader", "the person with high altruistic ideals"—indicating which of the persons described would, in her opinion, find her work congenial. Finally, she is asked to supply confidential particulars of her personal and family history. The object of this last section of the questionnaire is to enable the psychologist to judge, as well as may be, the characteristics of the persons who experience different satisfactions and dissatisfactions in one and the same employment. It is hoped, however, to obtain further light on the matter in supplementary interviews.

¶ 7. EXAMINATION OF GOOD AND BAD WORKERS. There can be little doubt that such investigations will provide more accurate knowledge of occupational requirements than can be acquired casually or gleaned from existing

[1] By the National Institute of Industrial Psychology.

publications. But it is desirable that the psychologist's estimates should, whenever possible, be checked by the subjection of successful and unsuccessful workers to an intensive examination, including psychological tests and careful temperamental studies. Already various occupational groups have been examined by means of intelligence tests.[1] The most extensive investigation of this kind is that conducted in the American Army, in which tests were applied to very large numbers of recruits drawn from a great variety of occupations. The army data show that the occupations may be arranged in a hierarchy according to the average intelligence of their American representatives, the professions being at the top and the unskilled manual occupations at the foot. For example, the average score (out of a possible 212) obtained by clergymen was 152, by physicians 127, by book-keepers 101, by electricians 81, by bricklayers 58, and by construction labourers 21.[2] But it was found that the occupational groups overlapped greatly, the range of the scores in any one group being very considerable. Although the average engineer was more intelligent than the average clergyman, some of the clergymen were far more intelligent than were some of the engineers. And even if doctors are, in general, more intelligent than elementary school teachers, it by no means

[1] For some interesting results *cf.* H. E. Burtt; *Principles of Employment Psychology;* Boston, 1926.

[2] Figures quoted by H. L. Hollingworth (*op. cit.*) from D. Fryer; "Occupational Intelligence Standards", *School and Society*, Vol. XVI, 1922.

necessarily follows that that is a desirable state of affairs. Clearly, the vocational psychologist cannot accept average scores of professional groups as a true indication of professional requirements. He must try to determine the *minimal* requirements of the occupations by comparing scores, when possible, with estimates of efficiency. And in most occupations he will doubtless find that there is not only a lower limit of intelligence, below which the worker tends to be unsuccessful, but also an upper limit, above which he tends to be bored and dissatisfied.

¶ 8. STUDY OF SUBSEQUENT CAREERS OF TESTED PUPILS. There are obvious difficulties in the way of applying tests to representative groups of adult workers. Many persons are suspicious of psychology, which tends to be associated in their minds with the unpopular dogmas of the psychoanalysts; and the invasion of factories, offices and shops by psychological examiners is calculated to impede the progress of business. It would seem, therefore, that the chief hope of adding to existing knowledge lies in the investigation of the subsequent careers of young persons who have been psychologically examined at the age of leaving school. Very few studies of this kind have yet been reported; and the aim in such studies has usually been to investigate the reliability of the psychological technique as a whole rather than to estimate the determinants of efficiency in particular occupations. Much light on the latter problem cannot, however, be expected until large numbers of young people have been examined, and reports have

been obtained of their progress over a considerable period of years.

¶ 9. CLASSIFICATION BY FUNCTION. As the work of occupation analysis proceeds, it should be possible to substitute for the traditional classification of careers (according to superficial resemblances in nomenclature or in the materials dealt with) a new classification based on the physical and psychological functions involved. The various branches of the barrister's profession, for example, may be placed in quite different categories, and some departments of engineering may be classified with some of the wood-working trades. In analysing industrial occupations it is of course important to study the normal lines of promotion; for it is a poor service to a child to place him in a post, however suitable, from which he will be obliged to pass on to another that is definitely unsuitable.

¶ 10. DIFFERENT ROADS TO SUCCESS. Probably it will be found that in many occupations there is room for individuals whose characteristics differ not merely quantitatively but also qualitatively; for different men may achieve success by different methods.

Case 10.—A girl who wished to become an advertising copy writer was regarded as scarcely fitted for that work. The psychologist who examined her had studied certain writings of advertising men, from which he had gathered that the copy writer, although his selling is done on paper, should have very much the same characteristics as the man

who tries to dispose of vacuum cleaners on the doorstep. The girl, on the other hand, was of a quiet and gentle disposition and not at all of an aggressive type. She was advised to seek other work. Fortunately, however, she found it possible to obtain a post of the kind which she herself had desired; and some years later her firm reported that she had developed into a copy writer of exceptional ability. Her copy, although not of a forcible or 'snappy' character, was particularly effective in a quieter way.

The vocational psychologist, like the medical practitioner, learns by experience, and he cannot hope that, even after much experience, he will cease to make mistakes. All that he can claim at present for his occupational knowledge is that it is less imperfect than that possessed by most parents and teachers. Many of his tentative judgements of occupational requirements will doubtless be proved sound by future investigations; and it would be a mistake to assume that the application of his more exact methods of studying the individual should be deferred until he has improved his acquaintance with the careers. But such improvement is certainly one of his most urgent needs.

CHAPTER VIII

JUDGING VOCATIONAL FITNESS

¶ 1. INTERPRETATION OF EXAMINATION RESULTS. Having completed his testing and observing, and having collected as much supplementary information as possible, the psychologist, bringing together the results of his various inquiries, is able to form a picture of the individual examined, which often, if not usually, is far more true than the picture in the mind of the parent or the teacher. But the psychological examiner differs from the child's ordinary advisers not only in the extent and exactness of his knowledge but also in his method of applying that knowledge to the problem of the child's future career. Indeed, there are cases in which he is chiefly of service not by adding materially to the parent's information but by helping the parent to interpret the information that he already possesses.

Case 11.—A boy whose father was a physician expressed a desire to adopt medicine as his career. The father saw no particular objection to this plan but he sought the psychologist's confirmation of the wisdom of the choice. The latter found several reasons for regarding medical work as unsuited to the boy's characteristics. These characteristics were not very difficult to judge, and probably the account of them given in the report of the examination contained no important facts that were not already known. At any rate, the father agreed that the description was a true one; and, from his own experience of medical work, he recog-

nised also the truth of the psychologist's remarks regarding some of the special requirements of this profession. And, comparing the two pictures—of the boy and of the occupation—he saw quite clearly that they did not 'match'. Yet he had been unable to see this without the aid of the psychologist's orderly marshalling of the relevant facts. In vocational guidance, as in some other matters, it is one thing to make a true judgement and quite another to recognise the truth of a judgement when made.

¶ 2. SYSTEMATIC PROCEDURE. The method of diagnosing vocational fitness has been described by Burt as one of "progressive delimitation". First, the result of the intelligence test is considered; and at once whole classes of occupations are ruled out of account as being clearly above or clearly below the individual's general capacity. Then, within the group of occupations considered suitable on the ground of intelligence a further selection is made according to the nature of the individual's performance in tests of special abilities. If, for example, he has shown little mechanical ability, a large number of occupations which demand this special aptitude are dismissed from consideration. Sometimes at this stage the test results are studied in conjunction with certain of the temperamental estimates, the child being placed in one of three categories according to whether his outstanding characteristics render him fitted primarily for work with papers, for work with concrete materials, or for work with people. This threefold classification of the occupations—'clerical', 'practical'

and 'social'—is more useful when one is considering the future of elementary school pupils than when one is dealing with candidates for higher professional or commercial work, although here also it is possible to distinguish a number of occupations in which the interest is mainly academic, or practical or personal.

Next, consideration of special scholastic attainments, temperamental and moral characteristics, physical capacities and defects, economic necessities, and so forth, results in a further narrowing of the issue. The boy with good practical abilities but with a special disability in spelling is not well fitted for the trade of the compositor. The girl whose qualifications are predominantly of the social order may lack the emotional stability desirable in hospital nursing. The choice may be greatly restricted by medical or financial considerations, or by the desirability of removing the child from unsatisfactory home conditions, or of placing him in a situation where he will be under strict moral supervision. And so, as all the relevant facts, one by one, are passed under review, the boundary of the appropriate vocational field is gradually contracted until only a few of the available occupations (or types of occupation) remain, among which the final choice may be made on grounds of personal preference, financial prospects, and so on.

¶ 3. AN ART RATHER THAN A SCIENCE. From this description, however, the procedure may appear much more simple than in actual practice it is found to be. Just as the young physician discovers that the nicely differentiated

'clinical pictures' of the medical textbooks are seldom reproduced in the conditions which present themselves for diagnosis in the consulting room, so the vocational adviser soon learns that boys and girls, in respect of their occupational potentialities, cannot be fitted exactly into neat theoretical categories. Vocational guidance is an art rather than a science. Almost every case demands a careful weighing of conflicting considerations and the formulation of a balanced judgement which cannot be arrived at by a simple process of logic or by the application of any rigid, mechanical technique. "There is no foot-rule for vocational guidance that can be put into the hands of teachers or welfare-workers, and used with the ease of a thermometer or a pair of scales".[1] Often the psychologist gives his decision with far less confidence than is shown by parents and schoolmasters in their off-hand judgements. In his wider view of the data difficulties sometimes appear to which these others remain blind.

¶ 4. SIGNIFICANCE OF TEST RESULTS. Even in interpreting the result of the intelligence test, which is his most reliable instrument of measurement, the psychologist cannot achieve automatic precision; and probably no advance in occupation analysis will make possible a very exact determination of the minimal intellectual requirements of different kinds of work. For, within certain limits, marked special abilities or character qualities may compensate for

[1] *Cf.* C. Burt and others; *A Study in Vocational Guidance;* London, 1926.

a defect of general capacity, so that one dull person may succeed where another equally dull person would fail. On the other hand, a person of the highest intelligence is sometimes so deficient in other respects that it is not easy to predict success for him in any occupation suited to his intellectual calibre.

But a tentative classification of the occupations in respect of the degrees of intelligence which they demand is obviously essential; and in preparing such a classification the psychologist is not entirely in the dark. He is guided to some extent by the results of investigations such as that conducted in the American army; and he is continually obtaining useful indications both in his inquiries into the progress of boys and girls who have been tested, and in his examinations of older persons who are referred to him by employers or who voluntarily seek his advice when they are contemplating a change of work. With the aid of information derived from these sources Burt has drawn up a provisional scheme in which the commoner occupations are divided into eight classes.[1] Two classes are reserved for "higher" and "lower" professional and commercial work, and two for employments suited only to the mentally defective. The occupations commonly entered by the pupils of the elementary school are included in the remaining four categories, which are designated as follows:—"clerical and highly skilled work" (mental ratio 115–130), "skilled work" (mental ratio 100–115), "semi-skilled repetition

[1] *Cf.* C. Burt and others; *op. cit.* A similar classification has been published by D. Fryer; *Vocational Self-Guidance;* Philadelphia, 1925.

work" (mental ratio 85–100) and "unskilled repetition work" (mental ratio 70–85). In the first of these four classes are placed, for example, the book-keeper, the compositor and the electrician; in the second, the shop assistant, the turner and the carpenter; in the third, the waiter, the bricklayer and the driller; and in the fourth, the automatic machine worker, the farm hand and the chimney sweep. This scheme has been used in recent British experiments; but the investigators have emphasised its provisional and hypothetical nature, and have insisted that it merely indicates in the most tentative way the kind of calling advisable for any boy or girl reaching the specified mental ratio. The present writer's experience suggests that some of the standards set are perhaps too high. Nevertheless, the classification is useful as a rough guide.

The first class in Burt's hierarchy—"higher professional and administrative work"—contains such varied occupations as those of the lawyer, the physician, the architect, the scientist, the broker, the chartered accountant and the civil servant (administrative grade). Here, however, it is advisable to distinguish at least two sub-classes. On the one hand, there are occupations, such as those of the civil servant, the scientific research worker and the university teacher, in which extremely high intelligence is demanded either by the work itself or by the academic course which must first be completed if the individual is to stand a reasonably good chance of obtaining the work. Probably the career of the barrister should be placed here, if only because of the formidable nature of the competition in this

profession. Such occupations the present writer hesitates to suggest when the individual's percentile rank, among persons who have received a higher education, is below 90. On the other hand, occupations such as those of the physician, the solicitor and the chartered accountant, although doubtless there is room in them for brilliantly intelligent persons, can nevertheless be followed successfully by individuals of more modest abilities. In the present state of knowledge it is probably unwise to discourage boys and girls, otherwise fitted for these careers, from embarking on them unless they fall below the 50th percentile in the intelligence test. But the recommendation can certainly be made with greater confidence when the individual's percentile rank is in the region of 75.

Next, there are occupations which may be suggested not only for pupils of the public and secondary schools who are of average intelligence but even for those who are somewhat below the average. Examples are banking, surveying, the fighting services, commercial travelling, and certain types of agricultural and journalistic work. The purport of this statement must not be misunderstood. It is of course by no means true that only persons of comparatively limited intelligence should be advised to take up banking or farming. It is suggested merely that in these occupations such persons, if otherwise fitted for the work, may more easily achieve competence and earn an adequate livelihood than in professions such as those included in the preceding categories.

The problem of the public school or secondary school

boy whose intelligence is considerably below the normal of his social class is one of the most difficult with which the vocational adviser is confronted;[1] and the difficulty is often increased by the fact that the boy, painfully aware of his inferiority, shows no gifts of personality such as might compensate in some measure for his intellectual limitations. In many cases of this type it is impossible to suggest any wholly satisfactory solution of the problem. Probably it is to the less exacting departments of commercial work that such boys most commonly gravitate, and occasionally one finds them occupying, apparently with success, positions of an astonishingly remunerative kind in the business world. The writer has known a public school man who earned a four-figure salary in sales organisation, although his scholastic attainments were negligible and his percentile rank in the intelligence test was below 10.

Even more tentative than his interpretation of the intelligence test result is the psychologist's judgement of the vocational significance of results obtained in tests of special abilities. He does not know, for example, what is the lowest score in his test of form perception that is compatible with success in architecture. A high score encourages, and a low score discourages, the recommendation of the occupation; a performance of only average

[1] The problem is as old as Plato. "If the son of a golden or silver parent has an admixture of brass and iron, then nature orders a transposition of ranks, and the eye of the ruler must not be pitiful towards his child because he has to descend in the scale and become a husbandman or artisan."—*The Republic*, Book III.

quality, while it is not regarded as a very serious objection when the occupation is otherwise well fitted to the subject's characteristics, provides an additional reason for caution when the career seems a questionable one on other grounds. It is a matter of common sense and not of exact science.

¶ 5. SIGNIFICANCE OF TEMPERAMENT. Much remains to be discovered regarding the temperamental requirements of different occupations; but many of the ways in which temperamental and moral factors may affect vocational adjustment are sufficiently obvious. The shy, unsociable boy is happier as a clerk than as a salesman. The careless youth may do less damage as a porter than as a cabinet-maker. Courage and self-reliance are more important in an independent business or practice than in a 'safe' salaried appointment. The restless, unstable individual is likely to be happier in journalism than in actuarial work. The person who lacks the qualities of the leader may go farther in chartered accountancy than in staff management. The girl who possesses the tender emotion in a high degree may more readily find satisfaction in teaching or nursing than in chemistry or engineering. The man with a strong instinct of self-display may be more suitably placed on the theatrical stage than on an Australian farm. It is sometimes urged that the vocational adviser wastes his time in considering moral qualities such as industry and honesty and conscientiousness, since there is no occupation in which these qualities are not desirable. But even if universally *desirable*, character may be more *important* in some vocations

than in others. The dishonest boy is safer on a ship than in a bank; and the commercial traveller requires a degree of perseverance that is not essential in the inspector of taxes.

Temperamental deficiencies are studied carefully in relation to environmental conditions, and in many cases allowance is made for future development, although such development is difficult to predict with certainty. Often, however, it seems wiser to accept the individual's defects and to suggest an occupation in which they will not seriously impede his progress than to recommend a more ambitious and exacting calling which might conceivably 'make' him but would more probably 'break' him. Anxious and diffident individuals are commonly directed to 'safe' clerical occupations where they will be comparatively free from nervous strain. More difficult to advise is the markedly unstable boy or girl who demands change, variety and mobility and seems too irresponsible to succeed in any occupation in which these conditions obtain. Persons of this description are often sent for examination only after they have moved repeatedly from one vocation to another and have attained to an age at which employers do not usually welcome the novice. The method of 'trial and error' having failed, and the temperamental deficiencies having become more and more marked at each unsuccessful venture, the psychologist is invited to suggest how matters may proceed happily in the future. Alas! psychology is not magic. It may be hoped that future research will indicate the occupations to which the emotionally unstable most easily adjust themselves; but perhaps there will always

be individuals who "in ever-new expectation, ever-new disappointment, shift from enterprise to enterprise, and from side to side: till at length, as exasperated striplings of threescore-and-ten, they shift into their last enterprise, that of getting buried".[1]

¶ 6. SIGNIFICANCE OF SCHOLASTIC ACHIEVEMENT. The young person's academic record has an obvious bearing on his choice of occupation; but here, as elsewhere, the adviser must be careful to preserve his sense of proportion. Skill in modern languages is not in itself a sufficient qualification for the consular service; and a comparative inaccuracy in arithmetic, such as the averagely intelligent person can remedy without much difficulty, should not be regarded as an insuperable objection to a career in banking. A record of outstanding achievement in art or music or science may indicate definitely a probability of success in one of these directions; for in such cases the essential work of the occupation has already been tried and found suitable. Perhaps it is in the artistic callings that the most complete adaptation of the individual to his working environment is found; but these same callings attract many incompetent persons, and the pyschologist may sometimes render a useful service by pointing to defects of intelligence or of personality such as make a less precarious means of livelihood advisable.

¶ 7. DIFFERENTIATION WITHIN THE OCCUPATION. When possible, an attempt is made to indicate the precise depart-

[1] *Cf.* Carlyle; *Sartor Resartus*.

ment of a business or profession in which the individual is most likely to succeed. General medical practice demands a number of qualities which are not essential in the public health officer; and a boy who would find the pace of Fleet Street too fast may be happy enough on the staff of a provincial 'weekly'. In the present state of knowledge, however, it is sometimes difficult to avoid suggestions of a vague, general sort. Factory conditions, both physical and psychological, vary considerably from one firm to another within one and the same trade; and sometimes the choice of trade may be less important than the choice of employer. The following case illustrates the desirability of the adviser being acquainted with local conditions, or at least being in touch with a placement officer who has this knowledge.

Case 12.—An elementary school girl of very pleasant and superior character, keenly interested in domestic work, was anxious to obtain employment in a laundry which was situated in her home neighbourhood. The psychologist, seeing no objection to this plan, suggested that the girl should follow her inclination. Fortunately, he discovered in time that she was not likely to be at all happy in this particular place of business, where the girls employed happened to be of an extremely rough character, many of them having made their first acquaintance with the trade during their enforced sojourn in reformatory institutions.

¶ 8. THE "PERFECT NICHE" FALLACY. When the results of the vocational examination have been carefully studied in the light of the available knowledge of the occupations,

the examiner often finds himself without any clear conviction as to the individual's mission in life. "Many people seem to believe in a sort of vocational predestination. Somewhere in the world, they feel, there must exist a particular job for which they are ideally suited. They want to find it, and it alone. As a result, there has sprung up what we may call the fallacy of the perfect niche".[1] It is a fallacy that the vocational adviser quickly discovers. Rarely can he pick out a single occupation that is suitable above all others. Sometimes the individual has so many talents that there is no career in which he can use them all. Sometimes his abilities are so uniformly mediocre and his character so indefinite and colourless that there seem to be many jobs that he might attempt, in none of which he is likely to excel. Often an occupation that appears ideally fitted to some of his characteristics is totally unfitted to others. Often it is impossible to be sure that a career suggested as not obviously unsuitable will prove to be positively suitable. Always the aim is to direct the young person to work which will use his powers of mind and body as fully as possible, and will afford him real and lasting satisfaction because it is not only adapted to his abilities but also "proper to his instincts".[2] But in many cases this ideal is unattainable; and sometimes there is no instinct that the

[1] *Cf. The Choice of an Occupation*, ed. A. B. Crawford and S. H. Clement; Department of Personnel Study, Yale University; 1932.

[2] *Cf.* R. L. Stevenson; *Lay Morals*:—"That is his true sphere in life; not the one in which he was born to his father, but the one which is proper to his talents and instincts".

job selected is likely to satisfy, unless it be the instinct of hunger.

¶ 9. INTEREST AND ABILITY. A number of questions commonly raised by inquiring parents call for brief discussion. In the first place, what use can there be in discovering that a child is fitted for a particular calling if that calling is one in which he shows no interest? Is he not likely to be more successful in work that interests him than in work, however well suited to his abilities, for which he exhibits no enthusiasm? Is it not foolish to suggest that a boy with only moderate literary ability but with a marked mechanical bent should become an engineer when his sole ambition is to become a journalist?

The psychologist always studies the child's vocational interest most carefully and tries to discover whether it is superficial and fortuitous or rooted in a real suitability for the work. In the hypothetical case just mentioned one might decide that the boy, despite his mechanical ingenuity, was on the whole better fitted for journalism than for engineering; for to attach undue importance to any one factor in the situation is precisely what the adviser tries to avoid doing. In this event one might perhaps suggest the work of a wireless or motoring correspondent as an appropriate objective. Or the circumstances of the case might be such that one would assure the boy only that journalism was a possible choice, pointing to certain imperfections in his equipment for that work and suggesting that he should consider whether some other specified

occupation might not afford him more suitable opportunities. In which case, as the boy reviewed the problem in the light of the new information provided by the examiner, his interest in journalism might begin to wane and to be replaced by an interest of a more appropriate kind. Or one might be forced to conclude that journalism was a career in which the boy was almost certain to fail. In this case it might be possible to discover the particular satisfaction that he was seeking in the journalist's work and to effect a transference of the interest to another occupation which, while providing the same satisfaction, would in other respects be far more suitable. Cases of this kind are not infrequent. A boy, for example, who was fond of arithmetical work was advised to consider chartered accountancy, a career for which he had shown no inclination. He followed the advice; and some years later his comment was:—"I can only say how thankful I am that my inclinations at the time of the examination were not acted upon".

The writer has found that in about 50 per cent. of cases it is possible to encourage the examinee to pursue one of the courses which he himself has contemplated. In many other cases the result of the examination is the creation of a new interest; so that, when he follows the advice given, the individual is not taking up work that in prospect he finds distasteful. But suppose that this does not occur, and that the child retains an ambition which the examiner has judged to be wholly inappropriate. What is the parent to do then? That is a problem that the parent must solve for

himself. The honest vocational psychologist is the last person to claim that his judgements are always right. But the parent should remember these three things: First, the vocational interests of the adolescent are relatively impermanent. Fryer, summing up the results of a number of investigations, writes that "there is about a 50 in 100 chance of predicting specific vocational interests a year hence from present ones"; and he concludes that "to use an expression of interest as a guide to future plans is a very unscientific and impractical way of achieving an adjustment. The vocational interest estimate is of little significance for prediction. It is only important when linked with other significant criteria".[1] Secondly, the vocational interest, even when persistent, is by no means necessarily associated with a corresponding aptitude. Some of the most unhappy misfits that the writer has met have been persons who were not forced into their occupations by father or fate, but who chose their work of their own free will because it appealed to them almost irresistibly. Thirdly, among persons who are devoted to their work there are not a few who entered their occupations with very little hope of finding these occupations congenial.

In a recent study of the early occupational records of a group of boys and girls, educated in public and secondary schools, it was found that 45 individuals had entered occupations which they themselves had suggested and the psychologist had judged suitable, of whom 39, or 87 per cent., were successful; 10 had followed courses which they

[1] *Cf.* D. Fryer; *The Measurement of Interests;* New York, 1931.

themselves had desired and the psychologist had advised them to avoid, of whom 5, or 50 per cent., were successful; 25 had abandoned their provisional aims and had adopted one of the psychologist's suggestions, of whom 20, or 80 per cent., were successful; and 36 had taken up work of a kind which had neither been recommended by the psychologist nor desired by themselves at the time of the vocational examination, of whom only 17, or 47 per cent., reported success. "These results, tentative though they are, provide cause for reflection to those who maintain that the child's own inclination is the most reliable clue to the solution of his vocational problem".[1]

¶ 10. VOCATIONAL GUIDANCE NOT SOLELY FOR THE ABNORMAL. A second question that parents commonly ask is this:—If, in 50 per cent. of cases, the psychological advice merely confirms the child's own judgement, should not the examination be confined to the difficult cases of backward and neurotic children and children who are unable to make up their own minds? Cannot the ordinary boy, assisted by ordinarily intelligent and sensible parents, be trusted to solve the problem for himself?

Certainly it is for the abnormal that vocational guidance is most urgently required, but even the entirely normal sometimes make serious mistakes. Further, the course found suitable by the psychologist, even when it is one of those suggested by the examinee himself, is not always the

[1] *Cf.* A. Macrae; "A Second Follow-up of Vocationally Advised Cases", *The Human Factor;* February, 1932.

one that he would have chosen if left to his own resources. Moreover, the adviser is sometimes able to give specific direction to an appropriate but rather vague aim. For instance, a boy who was attracted to scientific work was advised to consider specialising in fuel technology, a career that he had never heard of but one that he now finds most interesting. Often, too, the mere confirmation of the individual's own proposals results in a much-needed increase of confidence. Consider, for example, this statement of a young nurse who is "immensely" happy in her work:—"I had a great desire to do nursing. My people, however, were of the opinion that I might not be suitable for it. Before coming to the examination I did not know whether it was right to try. When I left, a load of questions and doubts had vanished". Even young people who have rejected the advice offered sometimes express gratitude for the stimulus afforded by the psychologist's discovery that they possessed higher abilities than they themselves, or any other person, had ever suspected.

¶ 11. DANGER OF DISCOURAGING AMBITION. But what of those who find their abilities to be disappointingly low? In such cases does not the psychologist tend to destroy an ambition which, but for his blighting influence, might have triumphed over all difficulties and broken birth's invidious bar? Persons who propound this question invariably add another:—"What about Demosthenes?" But there is a certain lack of logic here. For it was because Demosthenes was uncomfortably aware of his deficiency that he strove

to overcome it; and to young people of his calibre the psychologist doubtless applies a spur rather than a bridle when he demonstrates their limitations.

It is true, however, that caution is necessary in discouraging the ambitions of the only moderately gifted. Always in such cases abilities are carefully considered in relation to character; and at least when certain occupations are in question, the individual may be given the benefit of a rather large doubt. The dull but zealous commercial traveller may perhaps be successful enough. Whether zeal may compensate for dullness in the physician seems more questionable.

When the defect is one of character rather than of ability, it is often far from easy to judge the wise course. A rather lazy boy has been advised to take up farming in the Australian Bush; and, so far, the plan appears to have worked satisfactorily. But that is not a course to be recommended for lazy boys in general. Discrimination is necessary, and discrimination is difficult. Doubtless mistakes are made.

¶ 12. ALLEGED BENEFITS OF MALADJUSTMENT. Critics of the rising generation occasionally suggest that the psychologist is merely pandering to the indolence of modern youth when he places young people in work which suits them and therefore involves them in no struggle with an untoward fate; for, so they aver, it is in such battles that character is fashioned. Perhaps the only comment that need be passed on this suggestion is that, even if vocational

maladjustment were accepted as the ideal first stage in every career, the need for the psychologist's activities would remain; for, without his guidance, many boys and girls might have the misfortune to drift into work of a congenial kind.

¶ 13. VOCATIONAL SELECTION. A more important question is the following: Does not efficiency in many occupations depend in part on aptitudes the testing of which is not included in the vocational examination as described in this volume? For instance, is a delicate sense of touch not desirable in the physician, a good memory for numbers in the telephone operator, and a quick 'reaction' in the chauffeur?

Many things are desirable that are not essential. Baumgarten[1] has published an inventory of about 100 characteristics which are useful to the physician, and it would not be very difficult to add to the list. But if every medical practitioner were required to possess each and all of these characteristics, there would be a serious dearth of recruits to the profession. Given the right intelligence and the right temperament and character, the physician, and many another professional man, may succeed without the aid of any marked accessory gifts.

The case of the telephone operator is rather different. But the vocational adviser cannot devote time to testing the

[1] *Cf.* F. Baumgarten; *Die Berufseignungsprüfungen;* Berlin, 1928. (French translation, *Les Examens D'Aptitude Professionelle;* Paris, 1931.)

memories of all his subjects in the hope of occasionally saving a girl from maladjustment in the Post Office. And even if he reserved tests of 'specific factors' for persons who on other grounds seem well suited to the work in which these factors are important, the number of the tests required would be impracticably large. Tests of a specialised nature are most conveniently applied by the employer at the place of business before the worker is engaged. This is called 'vocational selection', and it is an important supplement to vocational guidance. A few selection tests may, however, usefully be included in the guidance programme. In recent guidance experiments, for example, special tests[1] for clerical workers and for dressmakers have been applied in selected cases as a final check on the examiners' judgements of suitability for these favourite occupations.

¶ 14. VOCATIONAL SELF-GUIDANCE. Lastly, it is sometimes asked whether the prescription of occupational courses for boys and girls is not altogether wrong. To choose a career for a boy, it is suggested, is no more justifiable than to choose a wife for him. The responsibility of the decision must be the individual's own; and to direct him as to the career that he should follow is an unwarrantable interference with his liberty. This view is being emphatically voiced at present in America, where the counsellor, instead of providing a ready-made plan of life for the pupil, merely assists him to make his own plan.

[1] *Cf.* F. M. Earle and others; *Methods of Choosing a Career;* London, 1931.

Probably the British and American methods do not differ so markedly as this statement of the matter suggests. Perhaps it is largely a difference of organisation. When, as in America, guidance is given during repeated interviews in the school, there is time to lead the pupil gently toward a wise decision. When it is given as a result of a single examination in an institute outside the school, the advice must be imparted somewhat more abruptly. But it would be a caricature of the British method to suggest that the psychologist contents himself with announcing, for example, that a boy is not fitted for the career at the Bar which he is anxious to adopt, and that his vocation is that of the solicitor. What he does is to point to possible or probable objections to the boy's own aim and to suggest that he should consider whether certain other careers might not, for various reasons stated, prove more congenial. The adviser's observations are not made in the form of dogmatic pronouncements which the boy is expected to accept unquestioningly as the only authentic word on the subject. On the contrary, it is expected that the boy, with the help of his parents and teachers, will make his own decision after giving thoughtful consideration to the suggestions offered, as representing the best judgement of an expert person using the most reliable technique possible in a sphere where anything approaching certainty of prediction is admittedly out of the question.

The American counsellor, on the other hand, doubtless exercises a considerable, if unobtrusive, influence on the child's vocational choice. His primary functions are to provide occupational information, to teach the principles

by which a choice of occupation should be regulated, and to assist the pupil's attempts to analyse himself and to apply these principles in his own particular case. But how is this assistance rendered? How, for example, is the dull boy helped to estimate his dullness? Presumably by having the result of an intelligence test revealed to him. No doubt the manner of the revelation is greatly to be preferred to the British plan of conveying the information to the parent in a typewritten report; yet one wonders whether the two procedures are fundamentally opposed. Certainly there would seem to be at least one serious difficulty in the way of a strict application of the American doctrine of "intelligent self-guidance". For numerous young persons are not intelligent.

¶ 15. INEXACTNESS OF PRESENT TECHNIQUE. The writer has tried to emphasise the fact that the virtue of the psychological method lies more in the comprehensive and systematic survey that is made of the individual's characteristics than in any infallible accuracy of the judgements based on that survey. But, as a French author has pointed out, it is not only the vocational psychologist who is concerned with probabilities rather than with certainties. "La majeure partie des décisions humaines, et même les plus graves, sont prises sur des bases, sur des données de même sorte, et dans des conditions analogues. Presque exceptionnelles sont celles qui ont une rigueur d'allure scientifique. Les décisions judicaires, diplomatiques, les opérations commerciales sont œuvre de jugement,

d'appréciation; en médecine, en matière financière, législative, etc., on ne se décide pas autrement".[1]

Whatever the present imperfections of the psychological technique, it is difficult to believe that any impartial person, comparing that technique with the ordinary procedure of guidance, could have any doubt as to which of the two methods is calculated to produce the better results. But the matter has been put to an experimental test in certain recent investigations to which reference has repeatedly been made in earlier chapters. A fuller account of these investigations must now be given.

[1] *Cf.* P. Chavigny; *La Vocation de nos Enfants;* Paris, 1928.

CHAPTER IX

THE NEW METHOD ON TRIAL

¶ 1. THE FIRST LONDON EXPERIMENT. The first British investigation[1] of the value of psychological methods of vocational guidance was initiated by the Industrial Fatigue Research Board (now the Industrial Health Research Board), a Government department established under the Medical Research Council after the Great War for the purpose of investigating labour conditions in factories. The inquiry was conducted by this body in collaboration with the National Institute of Industrial Psychology, a private organisation which was founded in 1921, under the directorship of C. S. Myers, F.R.S., as a scientific association for the study of "the human factor" in industry and commerce. The work of the experiment, carried out during the years 1923–25, was directed by Cyril Burt, who originally organised the National Institute's vocational department, and has inspired many of that department's subsequent activities.

In this first experiment an intensive individual study was made of all the children due to leave three elementary schools in a certain borough of London. The number of the children amounted to exactly one hundred—52 boys and 48 girls. As a preliminary to the main research one of the investigators undertook a careful statistical analysis of

1 *Cf.* C. Burt and others; *A Study in Vocational Guidance;* H.M.S.O. London, 1926.

the situations actually obtained, in two thousand consecutive cases, by children who had recently left eighteen representative schools in the borough. The main local opportunities were thus clearly indicated, but no exhaustive psychological analysis of the occupations was attempted.

The children were examined by four investigators, each of whom specialised in the application of certain of the tests. Estimates of temperamental characteristics were made independently by the same four observers. The homes of the children were visited, and information as to scholastic progress and medical history was obtained from the teachers and from the school medical records. At the close of the inquiry the investigators met to consider the results and to formulate the vocational recommendations. Finally, a letter was sent to each of the homes, stating the occupation primarily recommended, with alternative suggestions, and explaining briefly and simply the reasons for the advice given.

Two years later the homes were re-visited for the purpose of inquiring into the nature of the posts held by the children, their wages and prospects, their satisfaction or dissatisfaction with their work, and their reasons for changing from one occupation to another. Ninety-four of the children were successfully traced, of whom all but two were found to be in work. Thirty had obtained employment of the type primarily recommended, twenty-two had taken up work which was similar, in its general psychological nature, to one or other of the occupations that had been advised, and forty were in posts which were neither recommended nor even similar to those recommended.

Of the children who were engaged in work of a kind recommended or similar to that recommended, 83.6 per cent. had found their occupations congenial and were satisfied with their pay and prospects; 14.3 per cent. were satisfied with their work, but not with their pay or prospects; and only 2.1 per cent. had found the work distasteful. The corresponding figures for the children in work dissimilar to that advised were 39.4 per cent., 18.2 per cent. and 42.4 per cent. respectively. The children in the former group were also discovered, as compared with their fellows, to be earning a higher average rate of pay and to have experienced fewer changes of situation. Only one of them had been dismissed —a small but active page boy whose services had been dispensed with not because he was inefficient but because he had committed the offence of "sliding down the banisters".

As the investigators themselves insisted, no great weight could be attached to these figures, owing to the smallness of the group of children studied; nevertheless, the results were distinctly encouraging. The weak part of the scheme was found to lie in an insufficient knowledge of the exact psychological requirements of the available occupations; and it was suggested that any further research "must be based upon thorough-going investigations by means of so-called job-analysis". It was also suggested that the value of the psychological method might be demonstrated more clearly if a record were kept of the results obtained by existing methods of vocational guidance among carefully selected 'control' groups.

¶ 2. THE SECOND LONDON EXPERIMENT. These recommendations were put into effect in a second, and much more extensive investigation[1] which was carried out during the years 1925–29 by the National Institute. This second experiment was supervised by F. M. Earle and was financed mainly by the Carnegie United Kingdom Trust. It was conducted in certain elementary schools served by the Finsbury and Holborn Juvenile Employment Exchange of the Ministry of Labour. Each term the names of the pupils who were due to leave school at the end of the term were arranged in alphabetical order and alternate names were then selected for inclusion in the group of children to be examined and advised by the investigators. The remainder, constituting the control group, received no special psychological examination but were advised at the school conferences in the ordinary way. The total number of children in each group was 600.

The scheme of tests differed somewhat from that adopted in the earlier experiment; and an important addition was made in the form of a special medical examination, conducted by a particularly well qualified member of the London County Council's school medical staff. Special forms were devised for recording systematically the physician's and the teacher's observations and the results of the visits to the homes. Knowledge of the occupations was gained by study of the literature, by discussions with juvenile employment officers, and by observations made

[1] *Cf.* F. M. Earle and others; *Methods of Choosing a Career;* London, 1931.

during personal visits to representative factories, workshops, warehouses and offices. Owing to limitations of time, however, the occupation analysis was neither so extensive nor so intensive as could have been wished; and no exact classification on a psychological basis was attempted.

In the first stages of the experiment each of the children in the tested group was seen in turn by each of the investigators, and the results of the several examinations were brought together and discussed at a round-table conference. In these early discussions a more or less standardised, though admittedly tentative, method of interpreting the data was gradually worked out, so that later it was found possible, without any considerable sacrifice of uniformity, to assign to each investigator the entire responsibility of examining a number of the children and judging their vocational potentialities. Typed copies of the decisions were presented at the school conferences in the form of specific occupational recommendations, accompanied by a short general statement of each child's characteristics. It was hoped that the latter information would aid the juvenile employment officers in their endeavours to place those children for whom no vacancies might be available in the particular occupations suggested. One of the investigators attended each school conference in order to furnish any explanation that might be required and to note the advice offered by the conference to the children of the control group. In the actual placing of the children no preferential treatment of any kind was given to the tested group; nor

was any special pressure brought to bear on the parents of these children, the results of the psychological inquiries serving merely as additional information which the parents could use if they felt so inclined.

The work of testing and advising was completed at the end of 1926; and regular inquiries into the progress of both groups of children were continued till the middle of 1929, by which time the young people had been employed for periods ranging between 4 years and $2\frac{1}{2}$ years. Various methods of inquiry were attempted. Visits were paid to the parents and to the employers, the records of the employment exchange were consulted, and information was supplied by the boys and girls themselves both by letter and in personal interviews during evening parties held in some of the schools. The number of children completely lost sight of was smaller than had been anticipated; at the end of the inquiry information was available as to the whereabouts of 84.8 per cent. of the boys and 81.1 per cent. of the girls. But the extent and reliability of the industrial histories varied greatly, insuperable difficulties having been encountered in many cases in the attempt to obtain complete and accurate records. The district in which the investigation was conducted was a poor one; and the average intelligence of the children and of their parents was somewhat below the normal. The locality was also one which contained a large proportion of very small businesses, in which no systematic employment records were kept. Moreover, the inquiry was made at a time when the demand for juvenile labour exceeded the supply,

so that there was no great difficulty in changing from one job to another, a course which many of the children adopted with considerable frequency and often for the flimsiest of reasons. These special circumstances were not calculated to lighten the investigators' task.

The nature of the information obtained was such as to render impossible a simple classification of the children according to whether they had followed or had disregarded the vocational advice offered to them at the time of leaving school. It was found that an extremely small proportion of them had acted on this advice in seeking their first posts, and that a great majority had attempted a number of occupations, varying considerably as regards congruity with the recommendations of the advisers.

The methods of analysis adopted were as follows: First, all the posts which had been held by the children and concerning which adequate information was available were classified according to the nature of the work to be performed. Three broad classes were recognised—work with papers, work with people, and work with materials—and under these main headings various sub-classes were distinguished. There were, in all, nine varieties of work for the boys, and seven for the girls. Secondly, all the posts were classified according to the degree of congruity of the work performed by the child with the work that had been recommended to him. Five carefully defined grades of congruity were recognised. Thirdly, the reports received from employers were placed in four categories according to the degree of satisfaction with the child's work which they

expressed; and the statements of the children themselves as to the suitability of their posts were similarly graded on a four-point scale. Finally, the reasons given for leaving posts were classified according to whether they appeared, or did not appear, to indicate unsuitability for the work abandoned. Various difficulties were met with in the making of these classifications, which could not be regarded as particularly exact.

These preliminary analyses having been completed, attempts were made in the following ways to estimate the value of the advice that had been offered to the tested and control groups of children. In the first place, studies were made of the length of tenure of posts, or rate of change of occupation; and in this connection the analysis of the posts retained since the date of leaving school is of particular interest, since such occupational stability must be regarded as one of the best possible criteria of industrial success. Both in the tested and in the control group the percentages were calculated, for each of the various classes of work, of the children who had remained in one and the same post since leaving school, separate figures being worked out for the cases in which the work so retained was of the class recommended and for those in which it was of a class different from that recommended. It was found, for example, that of the tested children who entered clerical work, this class of work having been recommended by the psychologists, 75 per cent. retained their first posts, the corresponding figure for those who took up this work when it was not recommended being only 35 per cent. In

the control group, on the other hand, only 44 per cent. of the children who entered clerical work on the advice of the school conference retained their first posts, while of those who entered this work against the advice of the conference approximately the same percentage—43 per cent.—made no change of post. This particular example is one that is specially favourable to the psychological method, but throughout the figures for the various other classes of work the same general tendencies are clearly discernible.

Secondly, the percentage of employers' reports of the various grades were calculated separately for posts of the five different degrees of congruity with the advice given. In the tested group it was found that, as the posts occupied became more and more unlike the posts recommended, the percentages of good reports tended to decrease regularly, while the percentages of bad reports showed a progressive increase. In the control group this double relation was less well defined, so that again the evidence pointed to the superiority of the psychological method of advising.

These two criteria of success—the retention of a single post and the satisfaction of the employer—were regarded as the most important, but the application of other criteria yielded similar results. Study of the reports received from the children themselves showed that satisfaction with the work was more commonly associated with posts of high congruity with the advice given than with those of low congruity; and again the tested group seemed to have the advantage. The analysis of the reasons for leaving posts seemed to afford less definite evidence of the value of the

psychologists' advice, but here the exact significance of the figures was difficult to determine. The general conclusions reached were, first, that vocational advising is feasible, the young people whose occupations are the most similar to those advised tending to be the most successful; and, secondly, that the newer psychological technique of vocational guidance is distinctly more reliable than the ordinary procedure followed by the school conference.

This brief account of the experiment conveys no adequate idea of the immensity of the task that confronted the investigators nor of the skill with which F. M. Earle, who prepared the analysis of the progress reports, succeeded in extracting meaning from what at first appeared to be a hopelessly confused and unpromising collection of material. The reader of the report cannot fail to admire the thoroughness of the efforts that were made to determine the validity of the psychological technique employed, and cannot fail to regret the unfavourable circumstances which caused the results achieved to be scarcely proportionate to the energy and ingenuity expended.

¶ 3. THE BIRMINGHAM EXPERIMENT. More striking results were obtained in a later research[1] undertaken in Birmingham, where the conditions were in some respects less difficult than those with which the London investigators had to contend. This research was conducted by the

[1] *Cf.* E. P. Allen and P. Smith; *The Value of Vocational Tests as Aids to Choice of Employment;* Education Committee, Birmingham, 1932.

Birmingham Education Committee and was planned on lines almost identical with those of the second London experiment. In effect, the investigation was an effort to explore the possibility of employing psychological methods as a regular part of the routine of an education committee's advisory work. Of the two investigators who carried out the testing and advising of the children, the one was a vocational psychologist temporarily attached to the staff of the Education Committee; the other, an assistant organiser in the juvenile employment department, had received a special training in psychological methods, and therefore combined the psychologist's technique of examining the child with the employment officer's knowledge of local industrial conditions. Each child in the tested group was examined by both investigators, and the latter also took part in the advising of the control group, making such recommendations as they could without the aid of special psychological methods. Consequently, any superiority in the advice given to the tested children, as compared with that offered to the control group, should be regarded as probably due to the greater reliability of the psychological method of advising and not, as a critic of the London experiment might perhaps suggest, to any higher general qualifications possessed by the persons employing that method.

The experiment was conducted in three carefully selected elementary schools, and the total number of children included in the two equal groups was 328. Of the tested children 61 per cent., and of the control children 49 per cent., obtained first posts of the kind advised. Each child's

industrial progress was followed for a period of two years, and it was found possible to classify all the posts held in two categories—"accordance" posts and "non-accordance" posts—according to whether the work did or did not broadly conform to the advice given. The following are some examples of the results obtained in the analysis of the records of progress.

In the tested group it was found that 21 per cent. of the boys who started in "accordance" posts, and only 1 per cent. of those who started in "non-accordance" posts had retained their first post during the whole period of two years. The corresponding figures for the girls are 35 per cent. and 4 per cent. In the control group the percentages of the boys starting in "accordance" and "non-accordance" posts who retained these posts are 7 and 15 respectively, the figures for the girls being 20 and 15.

Of the whole group of tested children 43 per cent. occupied one and the same "accordance" post during the two years of the inquiry, and only 9 per cent. retained a "non-accordance" post. Of the control group 27 per cent. occupied a single "accordance" post, and 30 per cent. a single non-accordance post.

Considered as a whole, the results of this experiment suggest more strongly than do those of the London investigation that the ordinary methods of advising children on the choice of work are definitely inferior to those practised by psychologists. Those children who follow the advice based on the psychological examination tend to be more successful than those who follow the advice of the school

conference; and those who disregard the psychologist's advice tend to fare worse than those who disregard the advice of the conference. Some of the figures even suggest that the child is more likely to succeed when he rejects the recommendation of the conference than when he accepts it.

¶ 4. OTHER EXPERIMENTS. Three other British experiments, the final results of which are not yet available, must be mentioned briefly. The Industrial Health Research Board has conducted an inquiry in Cambridge. Here the psychological examination has been given to all the children included in the experiment; but advice based on that examination has been imparted only to one half of the children. In Rugby a psychological examination of one hundred boys who had left the elementary schools but were attending part-time courses at the day continuation school was arranged in 1926 by the local education authority. The majority of the boys examined were temporarily employed in unskilled jobs and had not yet embarked on their chosen careers. No advice of any kind was given to them, the investigators merely recording their conclusions as to the most suitable occupations. These conclusions will be studied in the light of the information obtained from cumulative records of progress. Finally, a Scottish experiment, due largely to the generosity of the Dunfermline Carnegie Trust and the Laura Spelman Rockefeller Memorial, was begun in 1928. The subjects of this experiment include both urban and rural children in

the Dunfermline area. The children were first examined at the age of 11 and are being re-examined periodically throughout the remainder of their course in the elementary or secondary schools. It is hoped that, as a result of these repeated observations, light will be shed on the problem of the development of psychological characteristics from year to year during the pubertal and pre-pubertal periods.

¶ 5. RESULTS IN SECONDARY SCHOOL CASES. Although systematic research has been carried out mainly among children in the elementary schools, attempts have been made also to estimate the value of advice given in private consultations to young people from the public and secondary schools and the universities. It is difficult to arrange subsequent interviews with these persons, who do not inhabit a single district or even a single country; but postal appeals for information have met with an encouraging response. Questionnaires circulated among 321 individuals, examined during the years 1927 and 1928, were completed and returned by 225 persons, some of them resident in far corners of the earth. Many of these young men and women were still engaged in study at the time of the inquiry, but 134 (42 per cent. of the total number examined) had been at work for periods ranging from a few months to three and a half years. The questionnaire replies, taken at their face value, showed that among those who had rejected the advice offered the numbers of successes and failures were equal; while among those who had followed the advice the successes were more than nine times as frequent as the

failures.[1] These *primâ fâcie* results may be regarded as encouraging, although the incompleteness of the survey and the absence of a control group make exact interpretation impossible.

¶ 6. VOCATIONAL GUIDANCE ABROAD. Throughout the British Empire there are signs of a growing interest in the newer methods of vocational guidance, but notable practical developments have been comparatively few. Of the Empire countries perhaps the most progressive are Australia and New Zealand, where improved methods have been initiated by state departments of education[2] and by voluntary associations. In Sydney there is a flourishing Australian Institute of Industrial Psychology, which includes vocational guidance as an important part of its activities. Reports of pioneer efforts come also from Canada, from India and from South Africa.

On the Continent of Europe very important developments have taken place during recent years; and in many of the larger cities psychological methods of guidance are now being used either in private institutes or in vocational guidance offices subsidised by public funds. The first European office was established, before the war, in Brussels, where the work appears to be extremely well organised.

[1] *Cf.* A. Macrae; "A Second Follow-up of Vocationally Advised Cases"; *The Human Factor;* February, 1932.

[2] *Cf.* G. R. Giles; "Vocational Guidance in Australia in 1932," *International Labour Review*, Vol. xxvi, 1932. *Cf.* this Journal also for occasional surveys of guidance activities in Europe.

The acute labour problems consequent on the war created a special need, particularly in France and Germany, for advisory agencies, and in these two countries legislative measures were passed providing for the setting up of vocational guidance bureaux to co-operate with the public employment exchanges. It is perhaps in Germany that psychological methods are now most widely applied. Here psychologists are attached to the employment exchanges, the work being under the control of the Federal Government. In other countries it is often the individual municipality or university that has taken the initiative in providing improved facilities. Barcelona, Madrid, Moscow, Paris, Lyons, Strasburg, Geneva, Warsaw and Vienna are a few of the centres in which notable schemes of guidance are now in operation. In Bordeaux there is a bureau which makes a special study of trade requirements; and its director has published an interesting collection of systematic but somewhat incomplete occupation analyses.[1]

A special feature of Continental practice is the importance attached to medical assistance. The child seeking advice at the vocational guidance office is commonly subjected to a very thorough physical examination, supplementary to that given in the school. In the main, the guidance movement on the Continent seems to have developed outside the educational system, although the advisers maintain a close contact with the schools, as well as with the placement agencies. The child leaving school is not usually obliged

[1] *Cf.* F. Mauvezin; *La Rose des Métiers;* Bordeaux.

to attend the guidance office, examinations being given only to those who apply for advice on their own initiative or who are referred by teachers or others; and when the applicants are numerous, psychological tests are used only in selected cases. In Vienna, for example, a comparatively small percentage of the thousands of boys and girls who annually attend the municipal guidance office receives a special psychological examination, although every child is examined medically. It would appear to be a weakness of the Continental system that the careful psychological study of all children leaving school is precluded by the impracticability of employing sufficiently large numbers of psychological examiners.

¶ 7. AMERICAN METHODS. In America the stimulus to action has been not so much the necessity of the state as the ideal of service to the individual; and here the vocational guidance movement, which had its origin in 1908 in the work of Dr Frank Parsons at Civic Service House, Boston, has developed in close association with philanthropic agencies and with educational institutions of all kinds. The ramifications of the movement are now manifold and diverse, and all that can be attempted here is a brief reference to some of the main features of current practice. In a recent publication of the White House Conference on Child Health and Protection[1] the reader will find an interesting

[1] *Cf. Vocational Guidance;* New York, 1932. *Cf.* also "Recent Developments in Vocational Guidance in the United States"; *International Labour Review;* Vol. XXIV; 1931.

and detailed survey, based on questionnaire reports received from 150 American cities.

The objective testing method appeals to the American mind, which loves scientific precision; and for a time it seemed as if tests were threatening to enslave the psychologist instead of remaining, as they should remain, his useful servants. Tests were produced in great variety and were used somewhat uncritically, and there was a tendency to lose sight of the individual in the elaborate statistical treatment of mass data obtained by the application of tests to large groups of subjects. In 1928 Viteles[1] sounded a warning note and emphasised the importance of the 'clinical approach', by which he means that careful personal appraisal of the individual as a whole which from the start has been characteristic of the British method.

Nowadays the American psychologist realises that his business is to deal with personalities and not merely with percentiles; and in some quarters the reaction from the wholesale application of tests seems to have resulted in an over-cautious attitude toward the testing method. Tests of intelligence, however, are widely used; and the newer objective tests of scholastic attainment appear to be enjoying considerable popularity. Tests of special abilities, real or alleged, are commonly regarded with some distrust. On the other hand, the pursuit of the numerical score is seen in the attempts to obtain quantitative assessments of temperament by the statistical treatment of self-analysis questionnaires.

[1] *Cf.* M. Viteles; "The Clinical Approach in Vocational Guidance"; *The Vocational Guidance Magazine;* October, 1928.

In the main, American vocational guidance activities appear to be organised by the education authorities of individual cities and states. Guidance, or 'counselling' as it is usually termed, is an integral part of the educational system. It is carried out in schools and colleges of all kinds by counsellors of varying qualifications, who may devote their whole time to the work or may undertake it as an addition to ordinary teaching duties. The guidance given is educational as well as vocational, the child being seen by the counsellor not only when he is about to begin work, but also when he is contemplating specialisation in study. Great importance is attached to the provision of occupational information, the 'teaching' of occupations being part of the ordinary school curriculum. Sometimes the 'project' method is used, the child being required to prepare an occupation analysis from information obtained by his own efforts. Knowledge of the careers is imparted also by means of films, radio talks, and visits to industrial plants and other places of business.

'Group counselling' in class is supplemented by 'individual counselling', in which the child's problems are discussed in the light of information derived from his performance in intelligence and scholastic tests and his cumulative school record. Sometimes, as an aid to the vocational interview, the child is required to complete a questionnaire relating to his home and family circumstances, his likes and dislikes, and so on. The objects of the interview are first, to supply information regarding occupational opportunities and training courses (or to direct the

individual in his search for this information), and, secondly to help the child to estimate his own strengths and weaknesses so that he may relate his knowledge of himself to his knowledge of the available employments and so achieve his own vocational decision.

The National Vocational Guidance Association, which publishes the *Vocational Guidance Magazine*, serves in some measure as a co-ordinating agency. Attempts are being made to standardise the qualifications of counsellors, and in the State of New York the counsellor must possess a certificate in vocational and educational guidance. Many training courses for counsellors have been established, of which perhaps the most notable are those conducted by Kitson (Teachers' College, Columbia) and Brewer (Bureau of Vocational Guidance, Harvard). Other very prominent leaders of the movement are Bingham (New York), Strong (Stanford) and O'Rourke (Federal Civil Service Commission, Washington).

In the literature, both American and European, reference is sometimes made to schemes of inquiry into the subsequent careers of the persons advised, but results of investigations such as might indicate the value of the methods employed are conspicuous by their absence.

CHAPTER X

LOOKING AHEAD

¶ 1. EXTENSION OF PSYCHOLOGICAL PRACTICE. The problem of extending the practice of psychological methods of vocational guidance was discussed by Burt in a paper read at the 7th International Congress of Psychology at Oxford in 1923. "If the task is to be carried out upon any general scale", he said, "it would seem, at first sight, that the most appropriate body would be some department of the state or municipality. This department might be either (i) the Labour Exchange, (ii) a special government department, like the Industrial Fatigue Research Board, or (iii) the Local Education Authority. Of these three alternatives, the best appears, on many grounds, to be the last. Much of the data necessary, *e.g.*, the records of the medical inspection and of the child's progress at school, is in the possession of the local education authority. The school provides a natural place for the necessary testing or examination, and for the meeting of advisory committees. The Care Committee officers who know the home and the parents are usually officers of the local education authority; and the local education authority will also be most directly in contact with institutions which will provide future training".[1]

Two additional reasons may be suggested for placing

[1] *Cf.* C. Burt; "The Principles of Vocational Guidance", *Brit. J. of Psych.*, XIV, 4; 1924.

vocational guidance under the administration of the education authority. First, the authority has, among its teachers, potential counsellors who, if suitably trained, could carry out the examination of the child with less inconvenience and at a smaller public expense than would be entailed by the engaging of a host of visiting psychologists. In the second place, vocational guidance cannot be divorced from educational guidance; rightly conceived, it is merely the culmination of a continuous process of advising throughout the child's school life, the logical conclusion of the whole business of education.

¶ 2. PRE-VOCATIONAL GUIDANCE. At present the psychologist is often consulted when it is too late to give much assistance. His advice is sought by the born engineer, aged 18, who, owing to the prejudices of his father or his headmaster, has been forced to pursue an exclusively classical course. Week after week he interviews the intelligent child who, having for one reason or another fallen behind in his studies, has been regarded as a duffer, and, accepting this estimate of himself, has given up the struggle. Sometimes the teacher suspects, and repeatedly remarks, that such a child "could do better"; but, as has recently been emphasised,[1] there are many cases in which the child "*cannot* do better *until something is done to enable him to do better*". It is perhaps a fair criticism of the teacher to say that he tends to pay more attention to results than to the

[1] By Miss L. G. Fildes, in a paper read at the meeting of the British Association, Section J, 1932.

individual behind the results. Even in the much-vaunted English public schools there is many a boy who is seriously misunderstood. In particular, there is the really dull boy who drifts through his school course, consistently at the bottom of the duffers' form, gaining little knowledge and losing much self-respect; and all that his masters have to say of him, year after year, is that he "must read during the vacation and acquire some notion of style", or "must make great efforts next term", or must do a variety of things that he is quite incapable of doing. Sometimes the headmaster will foot the list of 'musts' with a "must acquire self-assertion". But such a boy, in such an environment, cannot acquire self-assertion. He is more likely to acquire a distressing form of mental disease known as *dementia præcox*.

As for the normally intelligent pupils with emotional abnormalities, their number is legion. "Having more or less botched the character of her child", writes Morgan,[1] "the mother sends him to school to be made into a noble citizen. Luckily this happens before the child has lost its plasticity and the teacher who understands her work can remodel the young children entrusted to her care". But sometimes the attempts at remodelling are a little crude. Clearly, a trained psychologist on the school staff could be of service in directions other than that of vocational guidance, and, by giving appropriate pre-vocational guidance, could in many cases render the later problem of vocational

[1] *Cf.* J. J. B. Morgan; *The Psychology of the Unadjusted School Child;* New York, 1925.

adjustment easier of solution than it commonly is at present.

¶ 3. SOME DIFFICULTIES. Obviously, there are difficulties in the way of establishing a school system of guidance. There is the headmaster who holds that the function of the school is merely to "train for life", and that if the pupil cares to drift into a particular sphere of life in which his training will not avail to save him from disaster, this is no concern of the pedagogue. There is the omniscient type of teacher who has no use for new-fangled psychological methods, preferring to trust to his own "experience", and forgetting that "experience may amount only to having done the wrong thing in the wrong way for forty years".[1] Further, there is possibly the difficulty, mentioned in an earlier chapter, of overcoming the child's normal inhibitions in the presence of the superior authority, and of establishing the entirely frank relationship which the vocational adviser seeks to achieve. Again, it is sometimes objected that the schoolmaster, especially when he proceeds to the public school with no more knowledge of men and affairs than may be acquired in the sequestered groves of Oxford or Cambridge, is of all persons the least acquainted with the world of work, and therefore the most ill-equipped to judge the vocational aptitudes of his pupils. Finally, it is conceivable that some parents might withhold from the teacher-psychologist the co-operation which they readily afford to the outside vocational specialist, in whom they

[1] *Cf.* R. R. Rusk; *Research in Education;* London, 1932.

often place the same pathetic confidence as they repose in the medical profession.

¶ 4. IMPORTANCE OF TRAINING. Whatever the difficulties of the plan, it is not easy to think of a better compromise. But vocational guidance is not work for any teacher, chosen at random from the school staff. Of all persons the prospective vocational guide is surely the individual for whom vocational guidance is most urgently required. At present there is perhaps a danger that Britain may fall into the error from which America is trying to extricate herself, the error of allowing vocational guidance to be conducted by enthusiastic and well-intentioned amateurs who, having acquired a smattering of psychological knowledge, proceed to practise psychology very indifferently in the schools. As Viteles[1] has insisted, the untrained teacher, "dignified by the title of counsellor [*Anglice*, 'careers master'], must be replaced by specialists in a distinct vocation raised to its proper professional level through the receipt of adequate training by those engaged in it". He wisely adds:—"The acceptance of this point of view may retard the speed with which the vocational guidance movement spreads, but it will also serve to set it on a firmer foundation".

Earle[2] has suggested a plan whereby the greater part of the psychological examining would be carried out by the

[1] *Loc. cit., supra.*

[2] *Cf.* F. M. Earle and others; *Methods of Choosing a Career;* London, 1931.

careers master under the supervision of an expert psychologist, who would be responsible for the training of the careers masters and for the general direction of the work in a given area. A further duty of the psychologist would be "to apply all published analyses of occupations to the study of those in his district, and when possible to carry his own studies of occupations to that degree of completeness necessary in his immediate problems". But neither the teacher nor the supervising psychologist would have time for research, and "it will therefore be advisable to have some central organisation for inquiry into new forms of tests, by the aid of which the development of better methods may be secured". An alternative plan of training is the establishing of regular courses at the universities and training colleges; and already these institutions, perhaps most notably in Edinburgh and London, are paying considerable attention to instruction in applied psychology. For example, the curriculum for the Academic Diploma in Psychology of London University includes the practical study of the work of a child guidance clinic.

¶ 5. FINAL CONSIDERATIONS. Guidance, to be fully effective, must be linked with placement, and the co-operation of the official placement agencies is obviously essential. There is need, too, for education of the parent; for the effort to provide advice that is not seriously considered is effort wasted. And not the least important co-operation is that which must be afforded by the employer, who can assist in many ways. In particular, his aid is indispensable

in the difficult work of occupation analysis and of following the progress of the young people advised.

Guidance should not only begin long before the child leaves school, but should also continue long after he has embarked on his career. Indeed, it should be a life-long service. Particularly in the early years of work, the young person should have an opportunity of returning to the counsellor for assistance in adjusting himself to his occupation or in effecting, when necessary, a change of employment. A repetition of the medical examination is especially desirable, in order that the tentative conclusions formed at the time of leaving school may be confirmed or modified; and in later life there should be a medical survey for the purpose of effecting occupational re-adjustments rendered desirable by the accidents of injury and disease which cannot be foreseen at the adolescent stage.

It is a large plan, and it will not come into being in a day. A modest beginning might be made by the improvement of the school-leaving form, the better organisation of the medical assistance and the application of intelligence tests to all children leaving school. As such tests are already used by many local education authorities in selecting candidates for admission to the secondary schools, a wider application of the method should not be difficult to arrange.

It is not only a large plan but also a costly plan; and there may be some who doubt whether the expense is worth while and whether it is not best to wait until the psychologist has improved his admittedly very imperfect technique. But, as Myers has insisted, "because tests are

in their youth it would be ridiculous to urge that therefore they must be put aside until they reach fuller maturity. We might as well have banned surgery and medicine a hundred years ago because they had not reached their present stage of advancement, or ban them to-day because they are not so efficient as they will be a hundred years hence".[1] It is not by research alone, but by research combined with a widespread practical application of his methods that the vocational psychologist will most rapidly advance his science and perfect his art. In truth, "it is safe to say that the greatest single need in vocational guidance is more vocational guidance".[2]

[1] *Cf.* C. S. Myers; *Mind and Work;* London, 1920.

[2] *Cf.* A. S. Davis; Foreword to *Vocational Guidance*, Report of White House Conference on Child Health and Protection; New York, 1932.

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